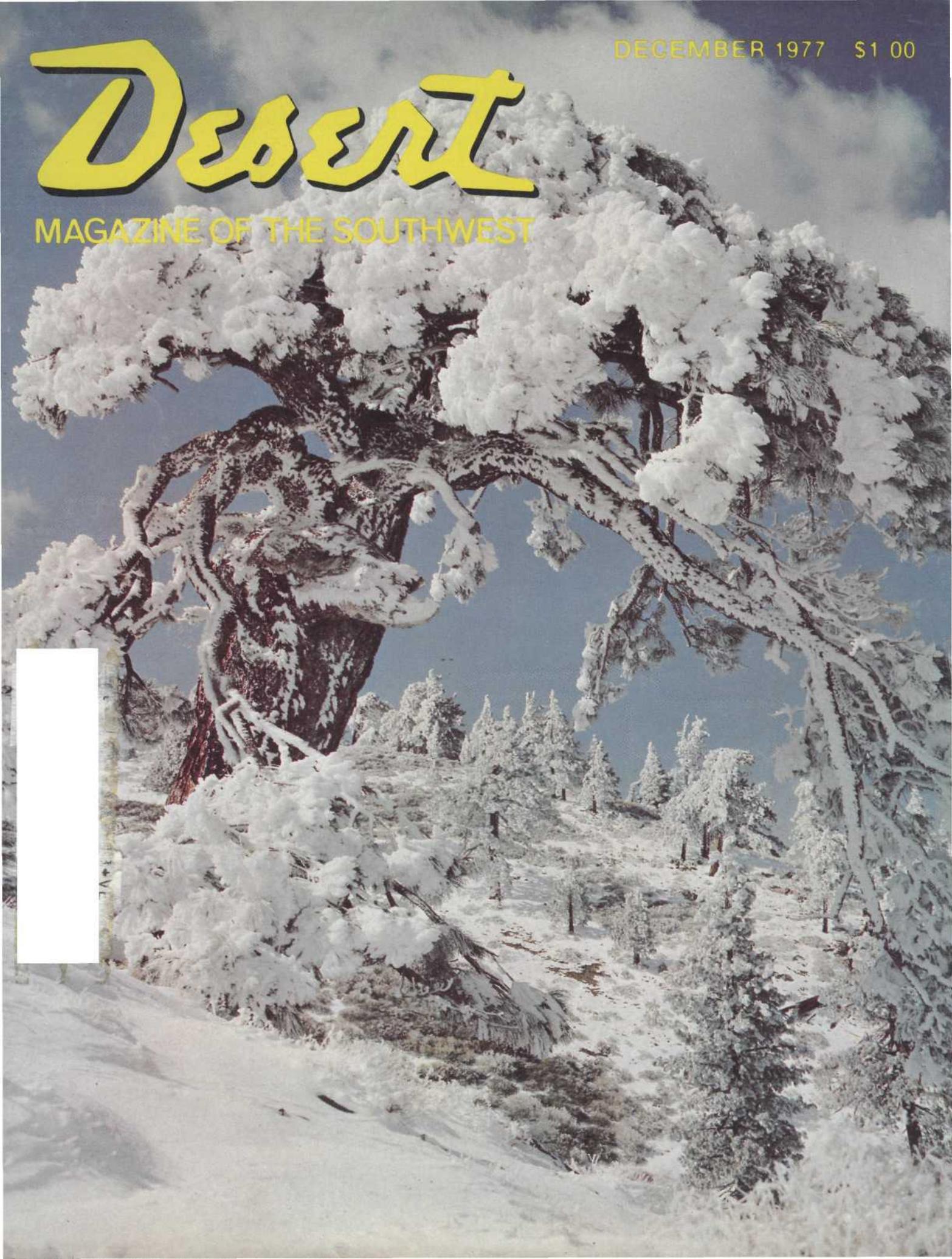


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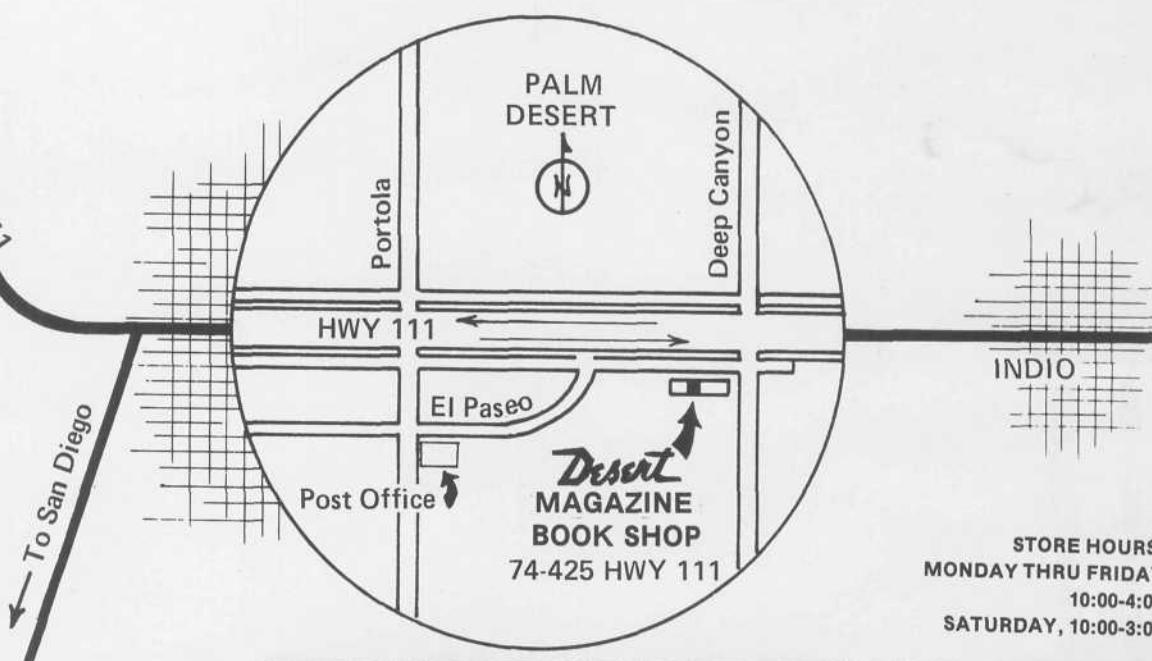
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THE COVER:  
A frosted Jeffrey pine in  
the San Gabriel Mountains  
of Southern California.  
Photo by David Muench of  
Santa Barbara, California.



Volume 40, Number 12 DECEMBER 1977

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# A Peek in the Publisher's Poke

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with peace on earth and goodwill to  
man. It troubles me that the spirit of  
Christmas is so brief for the majority of  
people.

One group that carries the banner of  
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four-wheel-drive outing on the Truck-  
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City, California. The Big Brother organiza-  
tion pairs volunteer big brothers with  
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the absence of fathers.

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roading with an experienced organization.  
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morning off-road trip through the desert  
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games, an evening meal of delicious bar-  
bequed beef and a campfire program  
ending with drawings for many donated  
prizes.

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ested in sponsoring similar events, who  
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Diego Four Wheelers, Box 2396, La  
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have been a memorable time for those  
young men of the future.

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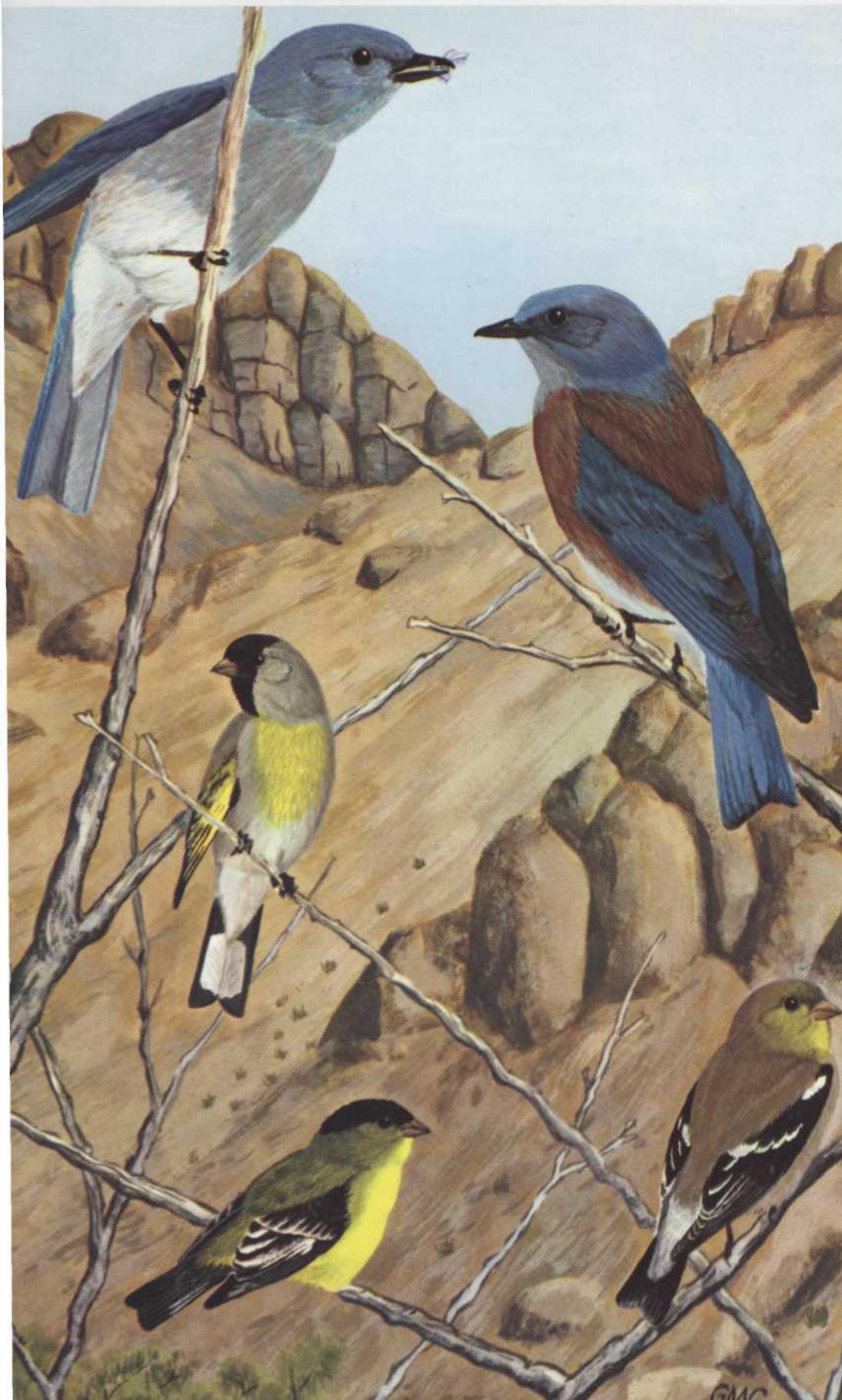
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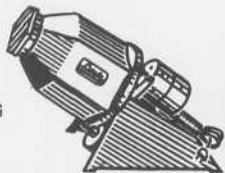
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# Books for Desert Readers

that any "find" will be the result of doing their homework. Homework in this case is research, a tedious task at best, delving into what has been written and recorded about any given subject. Tom Probert's bibliography is a wonderful research tool.

Wayland D. Hand, in his Foreword, best describes Probert's efforts and results:

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## NO. 13 IN A SERIES ON CALIFORNIA PALM OASES

# Lost Palms Canyon

by DICK BLOOMQUIST

OST PALMS Canyon is passable to vehicles for two-tenths of a mile beyond its confluence with Monsen Canyon, although this final stretch is often too sandy for passenger cars. Two living Washingtonias and two dead ones stand near the end of the road. By the first dead tree a narrow footpath leads to a low wooden door set between, and under, monumental boulders of white granite. Beyond the doorway an untimbered tunnel with a little water near its mouth cuts back into the living rock. A sign outside the tunnel explains its purpose: "Privately owned water supply. Please do not molest. Joseph L. Chiriaco. Chiriaco Summit." This is one of two places I have seen in the canyon where efforts have been made to tap the water supply. The other—a metal shed over a spring—is located upstream in the heart of the oasis.

Between these two points more boulders than palm trees fill Lost Palms (formerly Sutterfield) Canyon, but a trail along the left-hand slope bypasses the most congested stretches. After a little less than a mile, the edge of the oasis is reached as the watercourse veers to the right. Here several Washingtonias greet the traveler after the shadeless hike up-canyon. Around the next bend lies the shed mentioned above, its slanting roof covering a pool ten feet wide and a few

inches deep. Bordered by palms and rocks on the right side of the arroyo, this structure is easy to miss. A pipeline once carried water to Chiriaco Summit from the spring, but the line is abandoned at present and has several breaks in it.

Most of the palms display short-fronded, fire-blackened trunks. Small willows

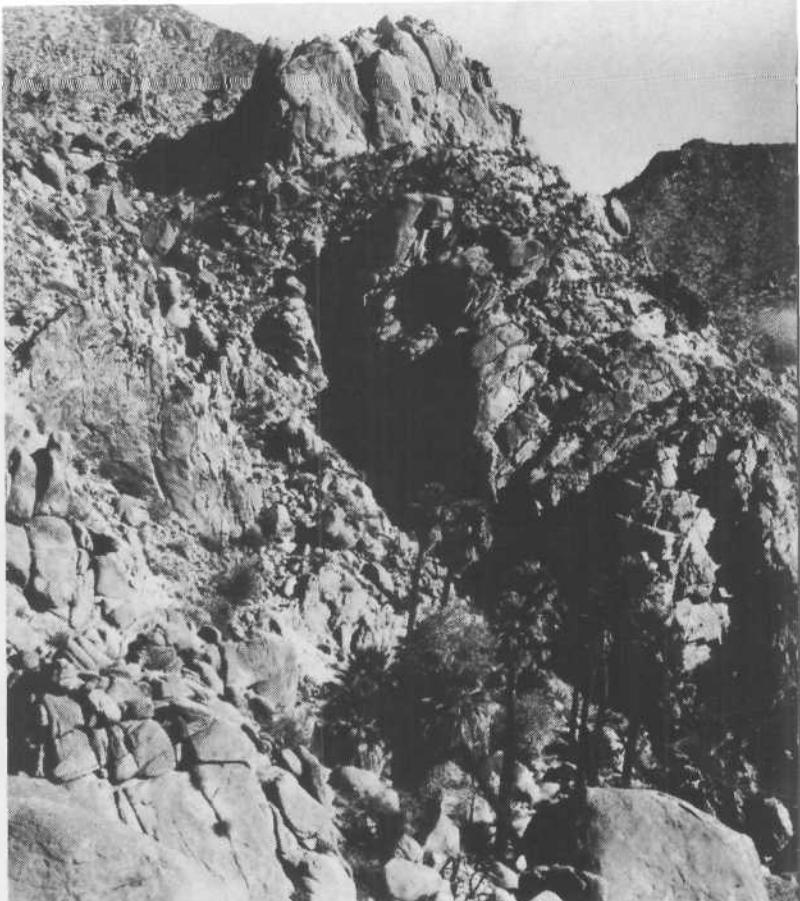
be seen by a precipitous promontory on the canyon's right side, opposite which a trail from Cottonwood Spring drops into the oasis. This old waterhole, also within Joshua Tree National Monument, is located four miles to the northwest near the Cottonwood Spring Campground on the other side of the mountains.

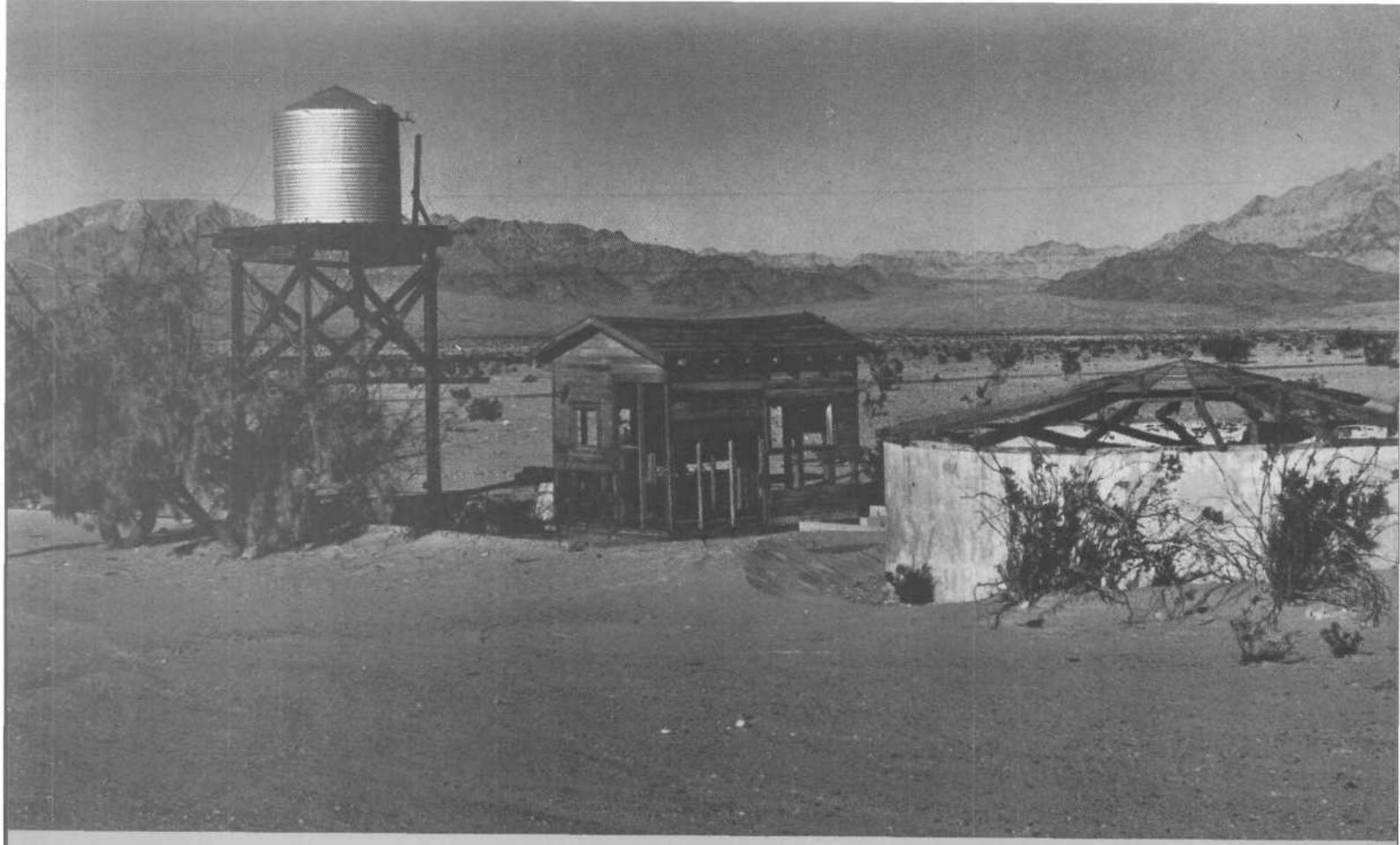
I headed back down the canyon a short distance beyond the Cottonwood Spring trail junction after having tallied 100 Washingtonias—85 along the stretch I hiked plus 15 counted from afar. There may be a few more farther upstream. Monsen Canyon, explored in the preceding article in this series, contains only 44 palms in its lower reaches, but in total trees it probably outstrips Lost Palms. Both rank among the highest oases in elevation in the California deserts.

With its tall fan palms and abrupt, bouldered walls, Lost Palms is indeed a fascinating oasis. An aura of mystery, of aloofness dwells here, despite the fact that the canyon lies within a much-visited national monument. "Lost" is still a fitting adjective for this sequestered grove high in the Eagle Mountains.

From the Eagles our desert trail will take us southwesterly to a pair of small but alluring oases near the Salton Sea—Sheep Hole Palms and Hidden Spring in the foothills of the Orocopia Mountains. □

grow among them, with yucca, ocotillo, jojoba and desert tea on the slopes. The tallest Washingtonias—I estimated one to be 50 feet in height—grow upstream from the spring. Several lofty trees can





*Little remains at the old camp of Bush, except the skeletal ruins of the water system. In background, Sheep Hole Pass separates Bullion [left] and Sheep Hole Mountains.*

# Three Salty Sisters

by MARY FRANCES STRONG

photos by Jerry Strong

WITHOUT SALT and other important salines, our health would deteriorate and our lifestyle radically change. However, few people seem to take much interest in saline mining, since it doesn't have the romantic, adventurous lure of gold, silver and precious gems. Yet, lowly salt was one of the first minerals mined in the California Desert Region. Prehistoric Indians exploited salt deposits long before they sought the gem—turquoise.

Sodium compounds are vitally important to modern man, not only for his dietary needs but as a source of chemicals used in industrial products and processes. As a result, saline mining has become an important and highly lucrative business.

Except when buried and protected from solution, saline minerals are found only in arid regions. These important minerals include calcium and sodium chloride, bromine, borates, sodium carbonate, sodium sulphate, iodine and potassium salts. Compounds of strontium, lithium and manganese may be added to the list, since they, too, are usually mined from saline brines.

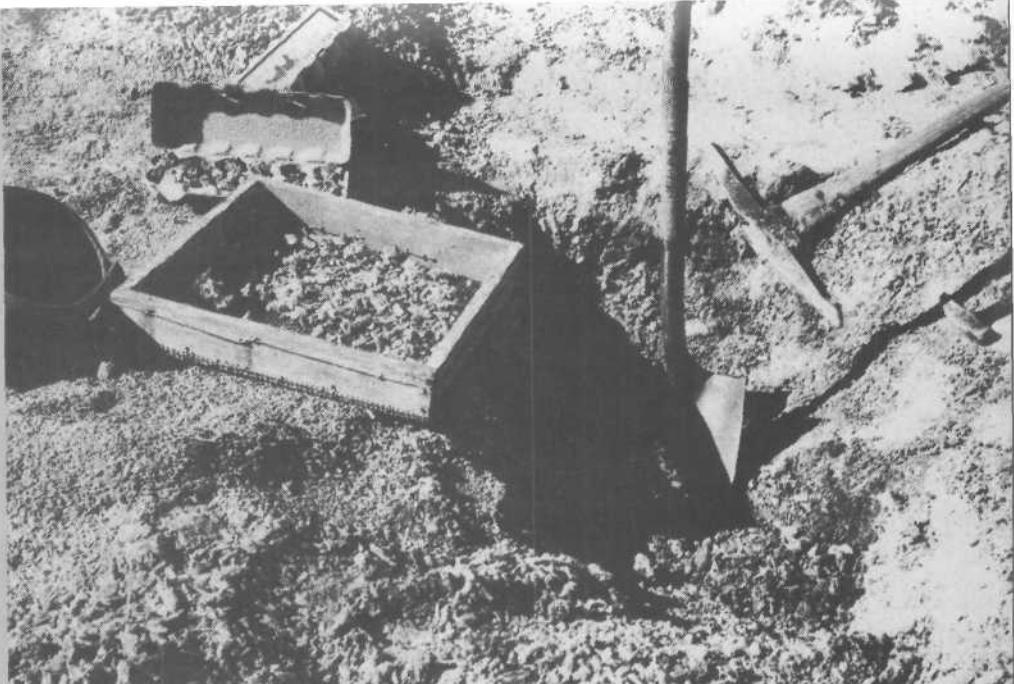
Every undrained desert basin supports a playa which, by the very nature of its existence, contains some degree of

*On Danby Dry Lake, a shovelful of dirt generally produces fine selenite and halite crystals.*

mineral salts. Playas are nature's "evaporative ponds" where an accumulation of salts from dilute saline water occurs. Such brines result from the attack of natural chemical agents upon minerals within the surrounding region.

The salts transported in solution to the playas where they accumulate through evaporation. The kind of salt or salts present depends upon the predominant rock type in the region and the natural chemical solvents present that interact with them.

Searles Lake, east of Trona, is perhaps the most well known of California's desert playas. First mined for borax in 1874, modern methods of mining still tap its vast subterranean brines. The saline brines of three other dry lakes in San Bernardino County have also been exploited. A tour of these "Three Salty Sisters" will provide visitors an intimate acquaintance with saline mining, the chance to collect crystals of halite, selenite and thernardite, as well as observe some mining activities. A ghost camp



and picturesque sand dunes will add interest to your trip.

*Let me caution here—do not trespass on posted property.*

The "Salty Sisters" lie within easy driving distance of one another. Most of the route is paved and the graded roads are good. Stock cars and those pulling trailers shouldn't encounter any problems.

#### BRISTOL DRY LAKE

Bristol Dry Lake, immediately south of Amboy on Old National Trails Highway—formerly Highway 66—is a good starting point for exploration of the "Three Salty Sisters." One of the largest desert playas, it encompasses a 60-square-mile basin in what is now one of the driest regions of the Mojave Desert. The latter fact has contributed greatly to

*Sodium chloride is precipitated from the brine in solar evaporative ponds by the National Chloride Company. The shimmering, white salt lies in striking contrast to the brilliant, blue-green brine.*



the successful mining of three saline products—gypsum, salt and calcium chloride.

While Bristol Lake's sizable deposits of sodium chloride (salt) were known in the early 1880s, the first claims were filed in 1904 on gypsum deposits along the northwestern edge of the playa. Consolidated Pacific Cement Plaster Company developed the claims and erected a plaster mill two miles southeast of Amboy. A narrow-gauge railroad was laid to connect it with the quarry.

Finding a source of energy for hauling the ore cars to and from the mill was no problem. It was provided by those most cantankerous but willing beasts of burden—"the onery mule." They served well for more than a decade.

Eventually, a new mill was erected closer to the quarry and the Santa Fe Railroad provided a half-mile spur to service it. Railroads like to give names to all junction points and "Funston" was chosen in honor of the then recently deceased Major-General Frederick Funston, hero of the Spanish-American War.

The little "salt railroad" not only hauled ore but provided transportation back and forth to Amboy where the

miners were housed. In fact, a special train was set aside solely for this purpose.

In 1919, U. S. Gypsum Company purchased the Amboy properties and continued production until 1924. At that time, the Amboy plant was closed and moved in its entirety (including the railroad) to Midland in Riverside County. The era of gypsum mining on Bristol Dry Lake had come to an end.

Meanwhile, the Crystal Salt Company, formerly at Danby, had followed close on the heels of the gypsum operation by filing claims for the recovery of calcium chloride in 1908. They, too, erected a mill and laid a narrow-gauge railroad to connect it with their quarry. It was known locally as the "Saltus-Bristol Line."

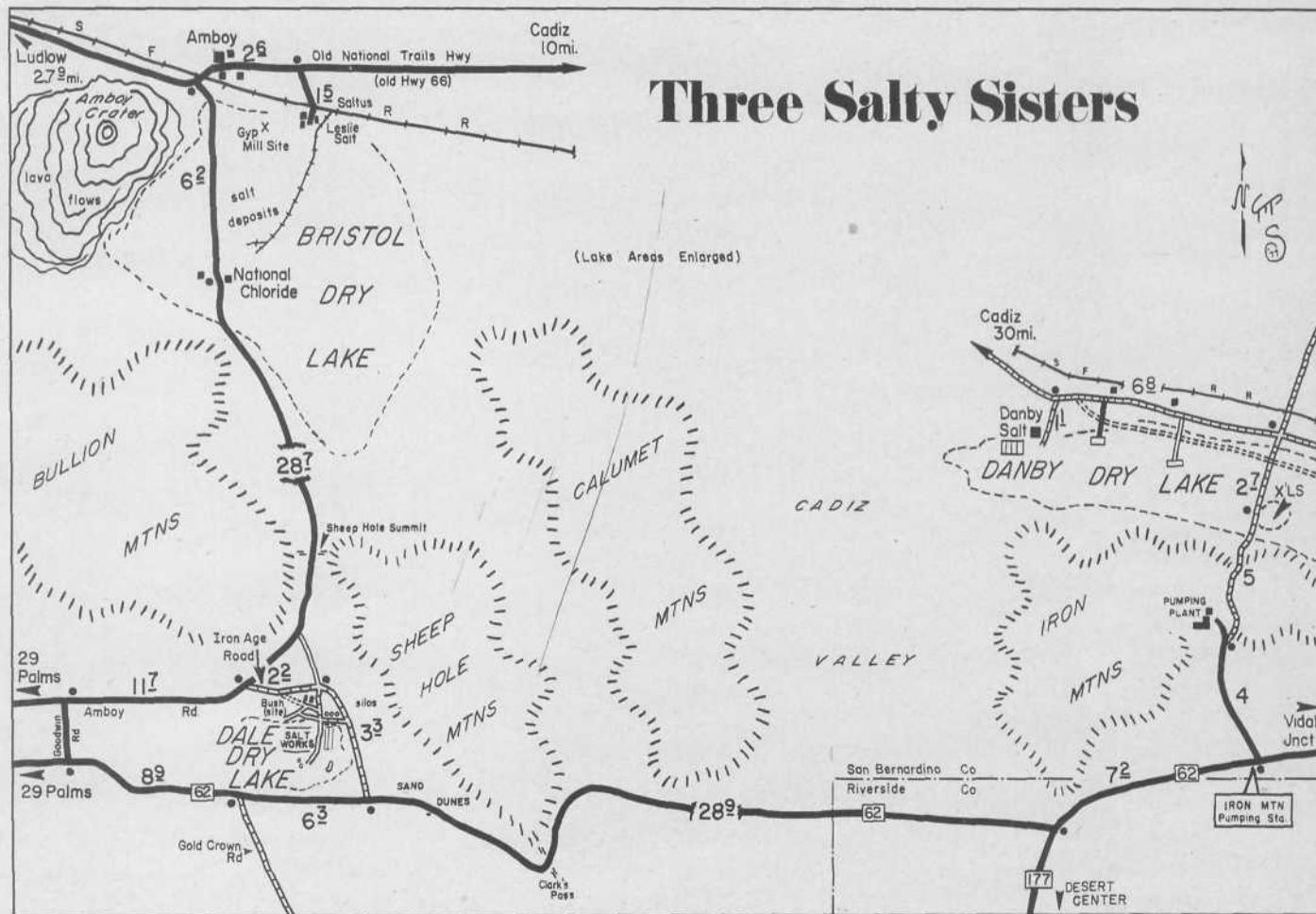
Calcium chloride was the important product during the next 12 years and most of the sodium chloride was discarded. Crystal Salt sold out to Consumers Salt Company in 1916 and a succession of lessees followed. In 1927, the California Salt Company acquired title to the property and, until recently, mined both sodium and calcium chloride.

Salt was recovered by stripping the

overburden from the uppermost salt bed. After drilling into the bed with an auger bit, the salt was blasted with dynamite. The broken salt was loaded by drag-line into dump cars, 20 to a train, and hauled about four miles to the mill. There it was crushed to minus  $\frac{1}{4}$  mesh size, washed in several spiral conveyors and placed in storage bins for future shipment. Calcium chloride was pumped from shallow wells and concentrated by solar evaporation. It was sold in liquid form.

Leslie Salt Company is the present owner of the operation at Saltus. We were quite surprised last spring (May '77) to find the mine and mill closed. We stopped at the office and talked with the maintenance superintendent. He asked me not to mention his name but offered to give a salt specimen (they fluoresce a beautiful pink) to anyone who comes to the office. They also have a nice display of specimens found during their mining operations. *Collecting is not permitted on their property. Please do not trespass.*

We are all familiar with the use of salt on the table and in our home ice cream freezers. Not so well known is its place



as an important industrial chemical; as a preserver of fish and meat; and as a salt-ice mixture for cooling railroad refrigeration cars. Other uses include water softeners, as well as in the manufacture of soap and synthetic rubber.

If the saline deposits of Bristol Dry Lake have any claim to fame, it is due to the over 25 percent calcium chloride found in its brine. Only one other California lakebed—Cadiz, which has not been exploited—is known to have a similar concentration. Consequently, Bristol Lake is the main commercial source of calcium chloride in the state.

At the present time, National Chloride Company is the sole producer on Bristol Dry Lake. In 1950, it acquired the claims originally developed by Hollar Chemical Company in the 1930s and has worked them almost continuously since then.

The recovery of calcium chloride is a rather simple process. Brine is collected from a series of canals cut through the uppermost layer of salt. The canals drain into a sump where the brine is pumped into a number of large, shallow, solar evaporative ponds. When the brine reaches a density of 40 degrees Baume, most of the sodium chloride has precipitated. The concentrated brine is then pumped into storage basins, loaded into tank trucks and shipped via rail.

Calcium chloride is sometimes converted to "flake" which has a  $\text{CaCl}_2$  content of 73 to 75 percent. The 40 degree liquor is evaporated by heating it in boilers to around 350 degrees F. The hot, saturated solutions are then chilled on revolving, water-cooled drums. Following several drying and cooling steps, the "flakes" are packaged in moisture-proof bags.

Calcium chloride has a variety of important uses such as an agent for de-icing roads, antifreeze for fire barrels, treatment of ores, the manufacture of algin from seaweed, and in the rapid drying of concrete. It is also useful for fire-proofing foliage, control of dust on road surfaces, playgrounds and parking lots, in the drying of walnuts, as a medium for oil-well drilling and as ballast in tractor tires.

Several years ago, Jerry and I had the pleasure of visiting the National Chloride Company's operation on Bristol Dry Lake. We talked with Bob Stephens—a pumper and grandson of the company's president. We presumed the young man



*This little "salt train" on Bristol Dry Lake carried salt from the middle of the lake to the mill at Saltus. In spring of 1977, Leslie Salt works on Bristol Lake was closed.*

was learning the business from the ground up. Bob explained their operations and gave us permission to drive around their property. We found the processes used not only interesting but beautiful!

In some of the empty ponds, precipitates resembled miniature "castles and spires" to rival well known caverns. Brown canals contained brilliant, blue-green brine with borders of pure white, crystalline salt. We appreciated the opportunity to learn more about saline mining and hoped some of our readers could do the same.

However, company president, Melvin Stephens, advised us he did not want *Desert's* readers stopping at the office and disturbing his employees.

Paved Amboy Road runs along the western edge of Bristol Lake and from it you can see some of the canals with their colorful brines. Along the shoulders of this county road, fluorescent salt specimens can often be found.

#### DALE DRY LAKE

Traveling south from Amboy, Amboy Road leads over Sheep Hole Summit and down to the basin containing Dale Dry Lake.

Dale is the smallest of the "Three Salty Sisters." It was the last to be developed and the first to have all operations suspended. The commercial possibilities of its extensive salt bodies—sodium sulphate (thennardite) and sodium

chloride (salt)—were first recognized by Irving E. Bush. He drilled a number of wells between the years of 1920-1924 and several attempts were made to mine the saline brines.

It wasn't until the Desert Chemical Company leased the property (they later purchased it), that production began. Ten wells were drilled in the lakebed and the brine was pumped into four large ponds to precipitate "Glauber's Salt" by solar evaporation. Recovered salt was treated at the plant by melting with steam then adding sodium chloride to "salt out" the anhydrous sodium sulphate or cake salt.

The remaining brines were either pumped into one of 16 small ponds for salt recovery or returned to the lakebed. During the winter months when temperature dropped below 45 degrees, sodium sulphate was precipitated by spraying the concentrated brine into the air.

A sizable camp developed around the plant and was named "Bush" in honor of the deposit's early discoverer. All went well for nearly a decade. In December of 1948, the price of sodium sulphate dropped to a point where mining was not profitable. Desert Chemical Company closed down and 85 employees were seeking new jobs.

Today, the picturesque ruins of the salt works and old Bush lie weathering in the desert sun. Huge concrete silos dom-

*Continued on Page 46*

**D**UR AMERICAN SOUTHWEST has always been famous for its fascinating variety of desert wildlife, but few of the singular animal species living there are more intriguing than *Rallus longirostris yumanensis*, the long-faced rail from Yuma, or, as he is popularly known, the Yuma clapper rail. Belonging to a California family which is still represented by small colonies living in the salt marshes around San Francisco Bay and in the dwindling tidelands along the Southern California coast, the maverick

Yuma rail occupies a unique spot among his scattered western family: not only is he the smallest member of the clan and the lightest in color but, most interestingly, he is the only member that inhabits inland freshwater marshes as well as the only one that has retained enough of his flight ability to migrate south in winter.

Historically, *yumanensis* has been much luckier than his distant cousins. These beleaguered relatives have always had to contend with high tides which

# YUMA CLAPPER RAIL



by  
**STANLEY  
MEDDERS**



The coloration of the clapper rail aids in camouflaging them amongst the marsh vegetation. Photos by Bob Gill, of the California Department of Fish and Game.

flushed them out of their protective vegetation and made them ridiculously easy targets for market hunters. These hunters, in fact, particularly during gold rush days, shot countless thousands of coastal rails, packed them in salt and shipped them to miners who were constantly clamoring for fresh meat. The Yuma clapper, however, has never had to worry about tides, and his placid life was at no time disrupted by market hunters. In the past, though, before he was protected by both state and federal law as an endangered species, miners along the Colorado occasionally shot Yuma rails for their tender, succulent flesh.

*Yumanensis* wasn't discovered until 1902, and even then he was thought to be a light-footed rail, a straggler, perhaps, from the salt marshes of Southern California. Indeed, he did resemble his coastal relatives in so many respects that it wasn't until 1923, when specimens taken two years earlier were more thoroughly examined, that he was recognized not only as a separate desert subspecies but also as a truly unique bird.

Because of his late discovery, and also since he is only a part time resident of our desert marshes, little is known of the Yuma rail's early history. For the past 20 years, though, scientists have taken a great interest in this secretive and elu-

sive bird, and their studies have brought to light a fascinating portrait of one of the desert's most interesting inhabitants.

Just as attractive, in his own way, as his coastal cousins, *yumanensis* is basically a pale grayish brown with an olive brown head. His dusky back and side feathers are edged in lighter gray, the ones on his chest are pinkish cinnamon, and those on this abdomen are dull white. These pale colors, complemented by swaths of white across the chin, throat and barred thighs, are somewhat drab; but they serve the rail perfectly as camouflage in the dusty tules and cat-tails where he makes his home.

This habitat, which stretches from the coastal marshes of Sonora and Baja California to Topock Marsh just south of Needles, consists mostly of dense stands of reeds growing along the banks of the Colorado River, or around small lakes adjacent to the river in both California and Arizona. Although Yuma rails inhabit marshes all along the U.S. portion of the river, most of them are restricted to marshy areas on the Havasu Lake, Cibola and Imperial National Wildlife refuges and to those on Mittrey Lake Arizona State Wildlife Refuge. Small colonies also exist around the Salton Sea, particularly in Wister Wildlife Refuge on the southern end, as well as in marshy

spots along the Gila River and in two areas of dense tule growth on the Salt River near Phoenix. In all these areas, the rails arrive in April and depart for Mexico in September.

A shy bird, *yumanensis*, like all other rails, spends most of his life among thick marsh vegetation; and, in spite of his streamlined body, which his ancestors evolved over the centuries to enable them to slip elusively through the tules, his feathers often become so tattered from the almost constant friction against the tangled vegetation that his appearance is completely bedraggled by the time he migrates.

Roughly the size of a small hen, the Yuma rail weighs just over half a pound, has long, skinny legs which are ideal for running as well as walking about on the mudflats, and an elongated, slender bill that serves him admirably when he probes in the shallow water and decaying vegetation to search for food. He is also adorned with a stubby tail, about two and a half inches in length, which is pale underneath and which he flicks almost constantly when he's strutting about on the mudflats.

Often an observer can come upon a solitary swaggering rail, or even a small group, feeding in the shallows. On several occasions in the Salton Sea marshes, I've had rails approach me with a seem-



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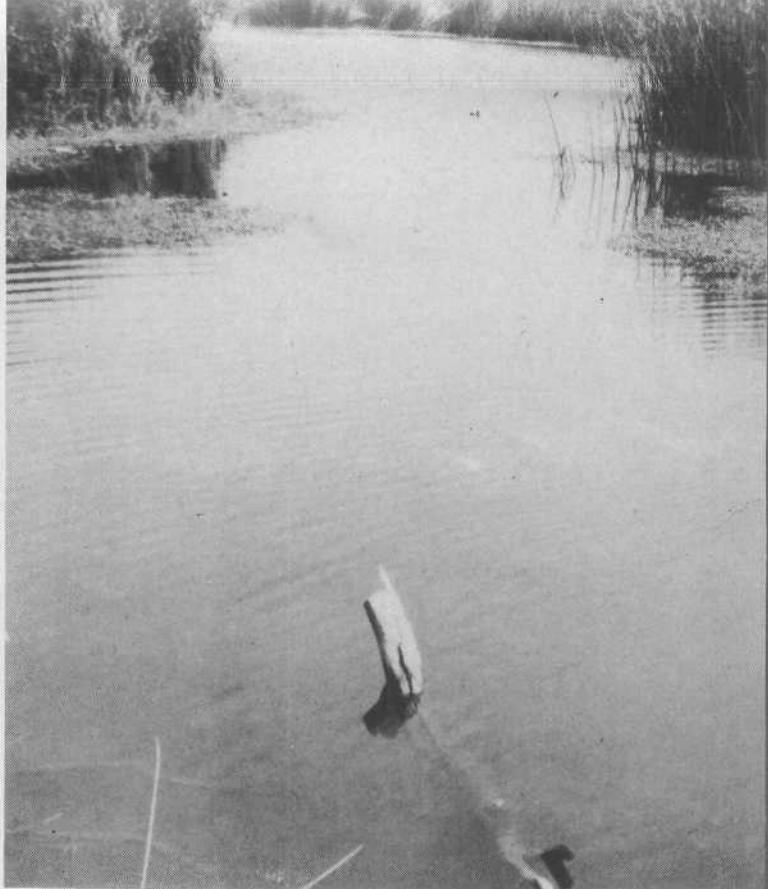
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*Typical marshy habitat of the Yuma clapper rail is this Colorado River slough, 20 miles north of Yuma, Arizona. Photo by author.*



ing lack of fear and even eye me disdainfully. Such mavericks notwithstanding, most rails are exceedingly skittish and disappear quickly when an intruder enters their domain.

When disturbed, the Yuma clapper rail rarely flies away. Since he's a good swimmer, he will sometimes take to the water and swim away beneath the surface or even dive and hold on to underwater vegetation until the intruder has left the scene. Usually, though, he simply lowers his head and slips quietly into the tules. This matted vegetation, in fact, is often crisscrossed with well-worn runways which the rails use not only as escape routes but as tunnels leading from their nests to feeding grounds.

Clapper nests, which the birds build during the mating season in May and June, are well concealed amidst the cattails and usually constructed on dry hummocks. Occasionally, though, they are built in the forks of small shrubs just above the water. Wherever located, they are ordinarily in the thickest stands of reeds surrounding shallow water, and in the vicinity of mudflats which will be used as feeding grounds.

In these nests, roughly fashioned from surrounding marsh plants, the Yuma rail lays from four to ten eggs, pinkish buff in color, and both parents are thought to share the incubation duties. The fluffy

black chicks are born during the hot summer months and are soon taught to forage for the many small organisms which inhabit the surrounding marshes. By the time the cattails begin to dry and turn gray in the fall, the young rails, which will attain an adult wingspan of approximately 12 inches, are strong enough to migrate south with their parents.

Although scientists aren't absolutely certain where the Yuma rail disappears to when he leaves the California and Arizona deserts in September, they're fairly sure that he heads for the Colorado River's delta area on the Gulf of California in Mexico. A number of rails do inhabit this region in the winter; and in these delta marshes, as well as in those across the bay in Sonora, the lush tule fields come alive yearly from September to April with the clarion kek-kek-brrs of the Yuma clapper rail.

These distinctive calls have been recorded on tape by scientists Tomlinson and Todd and have been used in our Southwestern marshes to flush elusive Yuma rails out of the cattails so the scientists could make an accurate clapper count. Following these studies, Tomlinson and Todd estimated that approximately 1000 Yuma rails spend the spring and summer months in the desert marshlands of California and Arizona.



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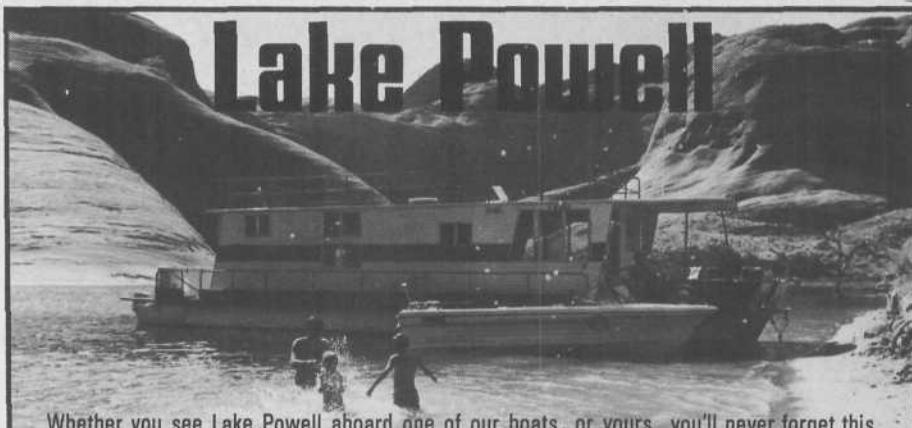
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This number is likely to increase, however, because of the creation of new marshes along the Colorado River, particularly on the state and national wildlife refuges now existing there. Before the creation of these refuges, the situation appeared somewhat grim for the Yuma clapper. In 1946, the Bureau of Reclamation was authorized to "control, modify, straighten or rectify" the channel of the Colorado. As a result of this channelization, or straightening by dredging, hundreds of acres of stranded marshes disappeared. South of Blythe, for example, Davis and Three Fingers lakes, both of which had held large populations of Yuma rails, dried up; and as their once lush marshes died, the rail colonies inhabiting them were forced to seek new habitat.

Since 1953, however, vast acreage on the wildlife refuges along both the Colorado and the Salton Sea has been re-flooded to create additional marshes. In all these areas, as soon as the sun drops behind the shimmering fields of creosote bushes and the desert begins to cool, the darkening marshes spring to life each May and June evening with the haunting notes of the Yuma rail as he boldly emerges from the matted tules to begin the lively courtship song that will perpetuate his fascinating species for eons to come.

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# New Clues to The Lost White Papoose Mine

**Somewhere in the vastness of Southern California's Santa Rosa Mountains is a long-searched-for gold mine. David Muench, of Santa Barbara, California, catches a portion of these rugged canyons in his dramatic color photograph.**

by DICK BLOOMQUIST

**I**N THE February, 1972 issue of *Desert Magazine*, there appeared an article by longtime treasure hunter Ken Marquiss (with a companion piece by his wife, Bessie) in which he described his unsuccessful twenty-year search for a lost gold mine in Southern California's Santa Rosa Mountains. Marquiss felt sure that the waybill to the treasure was genuine. According to the story, it had been drawn up in 1874 by a

man who, as a boy, had been captured during an Indian raid and taken into the tribe; the Indians later showed him a rich gold deposit in the Santa Rosas (hence the name "Lost White Papoose" for the mine).

Marquiss reproduced the decoded waybill in his article — titled "Verboten!" — and wished the best of luck to any readers who might want to take up the search for the bonanza. Below are the directions as they appeared on page 40 of the February, 1972 issue of *Desert*:

"About eight miles s of Fish Springs is large sandy wash. Go up main wash about five miles. (In a little side canyon you will see bunch of palm trees 14 or 15.) You will find water by digging. On up that canyon is a streak of clay.

"Up the main canyon 1½ or 2 miles a wide canyon goes to right. About two miles up that you come to three large tanks of water. 1st tank is about 20 ft long and 12 ft wide very deep. Only get water with long rope and bucket. The other two are almost impossible to get to but can see by climbing up the hill.

"After reaching tank go n which is s side of rabbit peak until you reach first wide wash. Up that wash you will find streak of white rock. Rock will be on hillside which is poor quality marble. Only a landmark. Then westerly until you see 2 large sabine pine trees at head of wide

wash. Near them you see large white rock standing like a sentinel on guard.

"If you go from Indian cabin on trail near fish springs, take the wide wash thas has indian symbols on large rock. Only indian signs on that side. Go up to top of mt where you will find trail to old indian hut trail to water tank—then n by w up side where you will find lead running n and s."

As to the mine itself, the ore is a "very dark brown, close-knit, granular rock." The vein has two paystreaks, separated by a foot or so of softer material, and the author of the waybill closed up the mine entrance before he left.

Marquiss told how he tramped the Santa Rosas off and on for 20 years in a vain attempt to find the Lost White Papoose. The order of the directions in the waybill did not fit the land; as he remarked, "there is no sequence, not even of two parts."

I have not—obviously—discovered the gold. Yet, by a different interpretation of the opening parts of the waybill, I have been able to establish a sequence in which the first several steps in the directions are in close or reasonably close agreement with the landmarks called for.

The waybill begins by describing a large sandy wash about eight miles south of Fish Springs (Fish Springs is on



the west side of the Salton Sea in extreme northern Imperial County and is today part of the community of Desert Shores). Approximately five miles up this wash the waybill calls for a group of 14 or 15 palm trees in a small tributary. The Marquises believed the wash in the question was Arroyo Salado and that the oasis was Seventeen Palms, located in a branch of the main watercourse. This is certainly a reasonable conclusion and is, in fact, the only conclusion possible in the light of present geography. In the past, however, another wash south of Fish Springs contained many more palms than it does today. And one of its ghost oases fits the waybill even more closely than do Arroyo Salado and Seventeen Palms.

This wash is Palm Wash. At the present time there is only one living palm tree in the arroyo itself, with another six scattered a short distance to the south. But dead trunks and earlier accounts tell us that years ago many more native palms graced Palm Wash than is the case today.

In an article in the August, 1945 *Desert*, Randall Henderson reported that in 1936 there were 27 living Washingtonia palms in or just south of Palm Wash; by 1945 the number had fallen to 13. In 1962 the count was down to 10, and now there are only seven. A diminishing water supply has been the reason for the decline.

With this great decrease in mind, it is my belief that the oasis of 14 or 15 palm trees referred to in the waybill is in a tributary of Palm Wash five miles west of the Highway 86 bridge. The trunks and stumps of eight dead palms are all that mark the place today; nevertheless, considering the drop in the palm population over just the last four decades, it is not unreasonable to believe that a century ago, when the waybill was drawn up, there could have been 14 or 15 living trees in the same spot. (Three of the Washingtonias were still alive in 1945, according to the August issue of *Desert* for that year.)

Palm Wash also agrees with the waybill mileage more closely than does Arroyo Salado. (The waybill begins: "About eight miles s of Fish Springs is large sandy wash.") Going due south from Fish Springs, it is 10 miles to Arroyo Salado as the crow flies; and traveling southeasterly along the route of State

Highway 86, it is 11 miles to Arroyo Salado (bridge #58-13). Palm Wash, on the other hand, is seven and one-half miles due south of Fish Springs as the crow flies; and going southeasterly from the spring along Highway 86, it is also seven and one-half miles to Palm Wash (bridge #58-46).

And now, the case for Palm Wash having been presented, let us look at the first several sections of the waybill. I have numbered and capitalized each call and enclosed it in quotes; after each part the relation of waybill to landmarks will be shown.

1. "ABOUT EIGHT MILES S OF FISH SPRINGS IS LARGE SANDY WASH."

As explained above, Palm Wash fits this mileage figure. And Palm Wash is a large and sandy arroyo.

2. "GO UP MAIN WASH ABOUT FIVE MILES. (IN A LITTLE SIDE CANYON YOU WILL SEE BUNCH OF PALM TREES 14 OR 15.)"

From the Highway 86 bridge 7½ miles southeast of Fish Springs it is 5.1 miles by my odometer to the small tributary where the ghost oasis already described is found. The dead palms are a few hundred feet up the tributary, which enters Palm Wash from the left, and are easily visible from the main wash. One tall standing trunk and parts of seven other trees can be seen here.

3. "YOU WILL FIND WATER BY DIGGING."

There is no water at the ghost oasis today. The decrease in the water supply was, in fact, what killed the palms, for the native fan palm requires moisture on or within a few feet of the surface of the ground to survive. Water must have been close to the surface 100 years ago when the Washingtonias were flourishing. The August, 1945 *Desert* already referred to mentions that there was a small brackish seep at the oasis earlier in this century.

5. "UP THE MAIN CANYON 1½ OR 2 MILES A WIDE CANYON GOES TO RIGHT."

Two and five-tenths miles up Palm Wash from the tributary containing the ghost oasis, the North Fork of Palm Wash comes in from the right. The mileages do not agree as well here but are still reasonably close. The North Fork, which joins Palm Wash a few feet inside the Anza-Borrego Desert State Park

boundary, is a large canyon well over 100 yards wide at its mouth.

6. "ABOUT TWO MILES UP THAT YOU COME TO THREE LARGE TANKS OF WATER. 1ST TANK IS ABOUT 20 FT LONG AND 12 FT WIDE VERY DEEP. ONLY GET WATER WITH LONG ROPE AND BUCKET. THE OTHER TWO ARE ALMOST IMPOSSIBLE TO GET TO BUT CAN SEE BY CLIMBING UP THE HILL."

Three natural tanks up the North Fork of Palm Wash fit this description perfectly, with the exception that today water can be obtained from the first tank (Sheep Tank) without using a rope and bucket.

The North Fork can usually be driven in a rig with four-wheel-drive or high clearance for 1.7 miles. After that it is necessary to hike for approximately three-tenths of a mile to reach Sheep Tank, making a total distance of almost exactly two miles from the confluence with Palm Wash.

Along the hiking portion of the route there is a short stretch where the North Fork narrows down to nine or ten feet in width, with sheer walls rising on both sides. On the left side of this narrow passage the words "To Gold" and an arrow pointing upstream have been cut into the canyon wall. The inscription could be someone's idea of a joke; however, considering the Lost White Papoose waybill and the correspondence of its opening sections to the Palm Wash-North Fork country, it might be genuine.

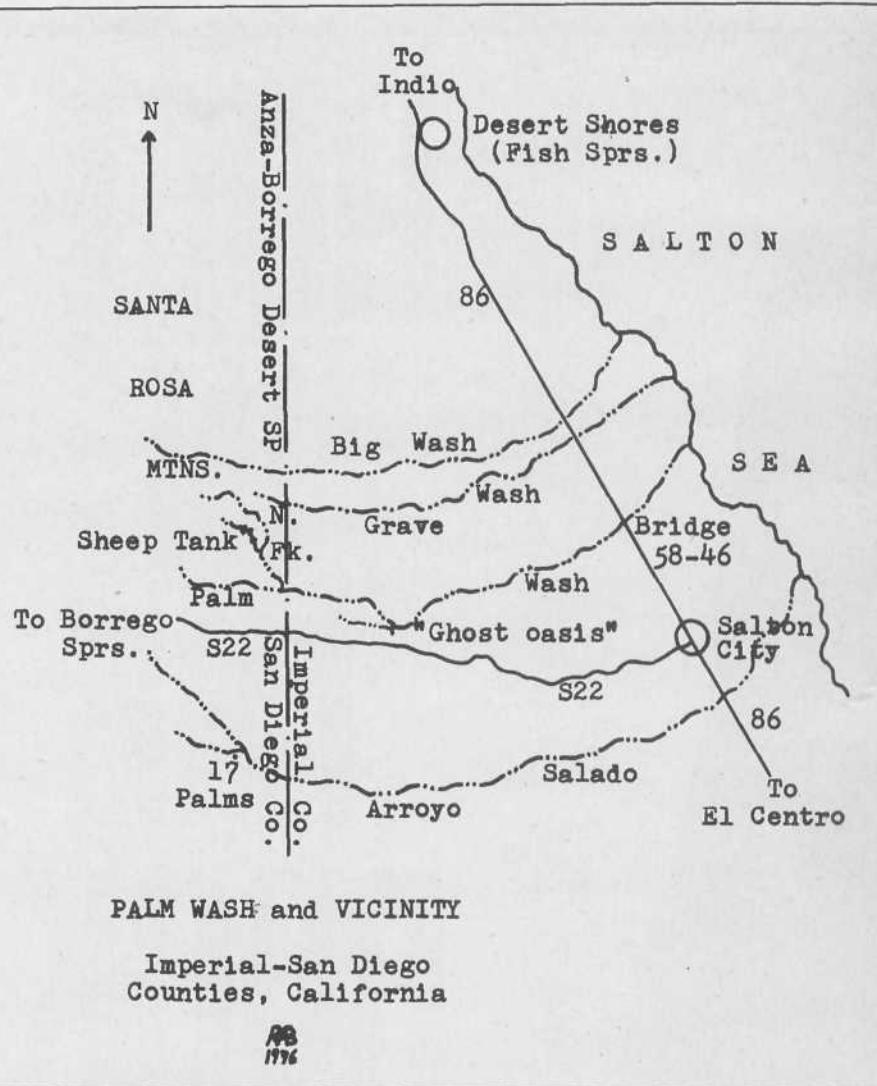
Just beyond the "narrows" the canyon divides. The right-hand branch is the North Fork, while the left branch is the tributary in which Sheep Tank is located; the tank is only a few hundred yards up this arroyo. As the walls of the tributary close in, more inscriptions can be seen, this time on the right side. They read "Water" and H.D. O'Neill, March 9, 1889."

A few more steps now and a low, dry waterfall across the canyon floor is encountered. It is easily detoured by climbing along a low ledge on the right side of the wash. A depression at the base of the dry fall holds water temporarily after rains, but this is not Sheep Tank. The permanent *tinaja* or water-filled rock basin known as Sheep Tank is several yards farther upstream where sheer walls on three sides block further progress up the canyon.

I estimated Sheep Tank to be approximately 20 feet long and 12 to 14 feet wide, dimensions which agree with those in the waybill. The *tinaja* appears to be quite deep, but the water is not clear and I was unable to determine the exact depth. The waybill states that water can be obtained only with a long rope and bucket. This is not true today, for it is possible to drink directly from the water-hole. However, within the tank there is a ledge covered by a few inches of water. This ledge breaks off abruptly not far from the rim of the *tinaja*. If, a century ago, the water level had been several feet below this drop-off, a rope and bucket would indeed have been necessary.

From Sheep Tank—named for the desert bighorn sheep that drink from it—I backtracked to a point just below the narrow passage where the “To Gold” inscription already mentioned is located. Here a rocky chute coming down from the left provided easy access to the mesa bordering the waterhole. I hiked upstream along the rimrock until I was a bit beyond Sheep. Below in the twisting depths of the slot-like canyon I could see portions of two more large tanks, tanks which answered the waybill description perfectly—“almost impossible to get to” but can be seen “by climbing up the hill.”

Sheep Tank and its two neighboring *tinajas* are the last features described in the waybill that I have been able to locate. Nevertheless, I do feel confident that these three waterholes are indeed the landmarks called for in the log of the Lost White Papoose. The tanks seem to mark a dividing line in the waybill. Up to this point the directions are clear-cut: there is a precise starting place (Fish Springs), and approximate mileages are given; even the dimensions of the first tank are included. Beyond the *tinajas*, however, the waybill becomes vague, and no additional mileages, not even rough estimates, appear. Sheep Tank is apparently only the beginning. The most difficult part of the route lies ahead on the incredibly rugged slopes of the Santa Rosa Mountains, country which, as Ken Marquiss knows better than I, can be covered only by extended backpacking. But with the three tanks as a definite jumping-off point, perhaps other treasure seekers with unlimited energy and optimism will be able to piece together additional parts of the waybill.



The key to the final series of calls would seem to be the watercourse described as the “first wide wash” north of Sheep Tank. Finding this wash could open the door to the waybill’s remaining landmarks—provided, of course, that one or more of them have not disappeared in the last 100 years.

Reference is also made in the waybill to two large Sabine pine trees (in this case red cedars, that is, junipers). Since the California juniper is a shrub or small tree of the high desert, this is an indication that the vein is well up in the Santa Rosas. On my own explorations north and northwest of Sheep Tank into Big Wash (which did not fit the waybill description of a “wide wash”), no junipers were visible on any of the near or distant ridges.

But even if treasure seekers should fail to locate the Sabine pines, the wide wash, or the other final landmarks, they will still find the region around and beyond Sheep Tank a rewarding one to explore. On the mesas and ridges overlook-

ing the steep-walled canyons there are numerous Indian trails, most still bordered here and there by rock markers; along one such trail I found a lone petroglyph—the figure of a man—cut into a rusty-brown boulder. And above Sheep Tank I came upon a low wall curving for some 20 feet on a shelf below the mesa rim. Add to this the inscriptions left by early white visitors, the spectacular narrowness which at times characterizes the canyons, the hidden waterholes, and the chance of seeing bighorn sheep, and you have country Zane Grey would have enjoyed using as a setting for a western novel.

The gold may be there. But if it is not, treasure seekers may take comfort in the words of the Spanish chronicler Castaneda, writing of Coronado’s expedition into what is now the American Southwest in quest of Gran Quivira and the Seven Cities of Cibola: “Granted that they did not find the riches of which they had been told, they found a place in which to search for them.” □

# HOLE IN THE ROCK

by ROGER MITCHELL



**H**E STORY of Hole in the Rock is the story of rugged pioneers who refused to allow hardships and natural barriers from blocking their way to the promised land. It is the story of blood, sweat and tears, and yes—success.

It was in 1878 that the leaders of the Church of Jesus Christ of Latter Day Saints, the Mormons, decided that it was vital to their interests to settle and colonize the four corners area where Utah, Arizona, New Mexico and Colorado all come together. They wanted to expand their sphere of influence as they saw a threat from the Navajo Indian and non-Mormon gentile who were both moving up from the south to encroach on their empire. By establishing colonies along the San Juan River, perhaps this could act as a buffer zone and block further infiltration into the heart of Utah.

But the San Juan Country was unknown to the Mormons. They were not sure of the best way to get there, or if they would find any arable land once they arrived. The first exploratory expedition left Parowan, then the center of Mormon affairs in Southern Utah, in April of 1879. They went south and entered the Arizona Territory by the traditional route. They crossed the Colorado River at Lee's Ferry, then turned eastward into the Navajo's land. Their reception by the Indians was none too friendly

as waterholes along the way had barely enough water as it was.

Finally the group reached the San Juan River in early June. They explored up and down the river and claimed any bottom land that could be plowed, irrigated and farmed. In mid-August two families were left to winter over at what is now Montezuma, Utah. The rest of the expedition returned to Parowan via the longer and more northernly Old Spanish Trail route. If they went back the way they came, or if they went the northern route via Moab and Green River, either journey would take them six weeks. Wishing to avoid the Navajos, they chose the northern route.

Upon returning to Parowan, the explorers talked to some settlers from the newly established colony of Escalante. If they went south from Escalante there might be a shortcut to the San Juan Missions, but nobody had ever tried it so the existence of a passable route was unknown.

Anxious to return to the San Juan Mission before winter set in, a second expedition left Parowan in October of 1879. This was a colonizing expedition consisting of some 250 men, women and children packed into 83 wagons and driving more than 1000 head of livestock. With luck they would rejoin the two families already there by Thanksgiving. But it

was not to be.

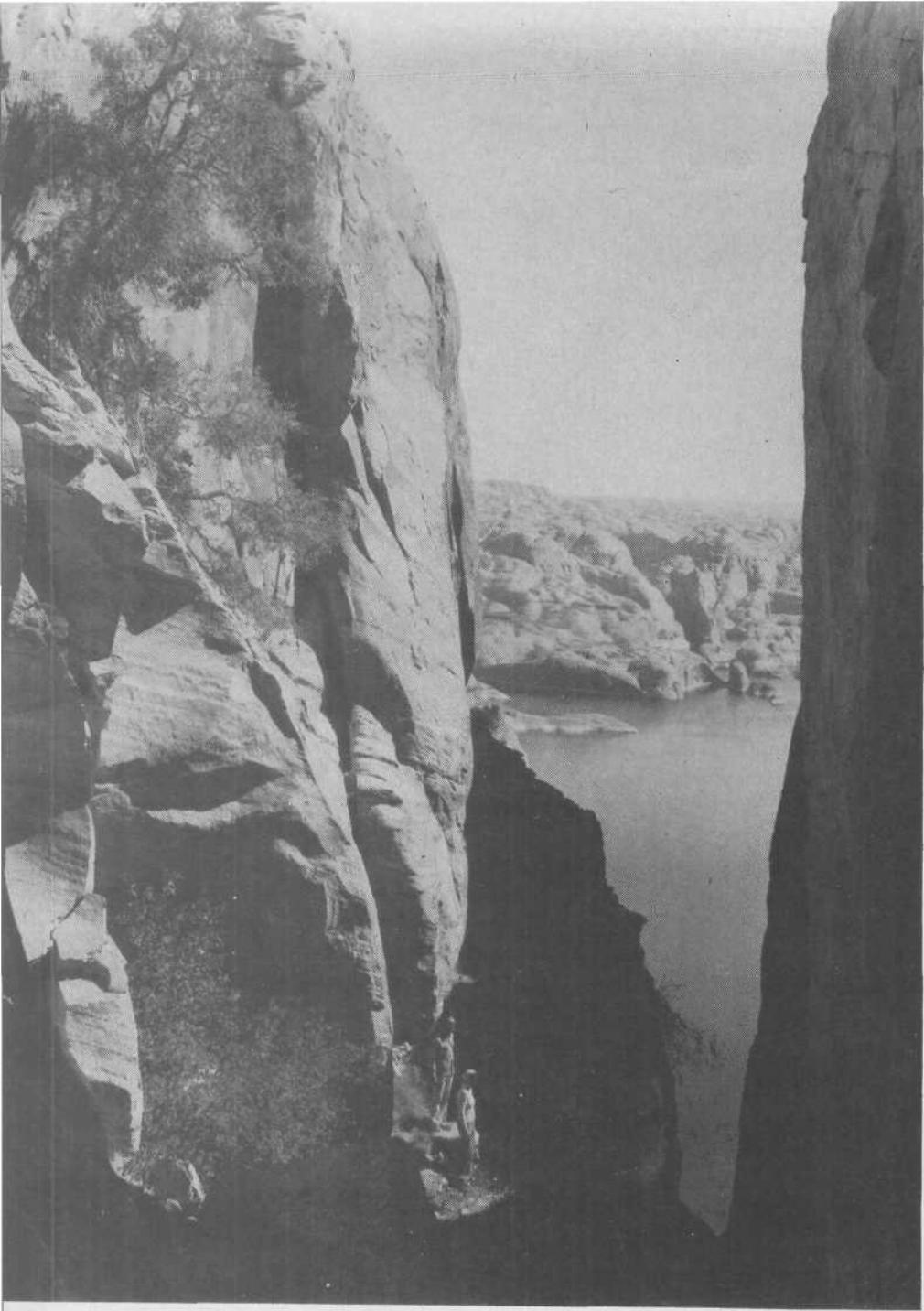
By mid-November they had reached a large rock outcrop near 40 Mile Spring, some 50 miles south of Escalante. Here the going got rough. Early deep snows in the mountains behind them forced them to decide to keep blazing a trail southward. While the main party established a camp at what is now known as Dance Hall Rock, scouts went ahead to pick the best route. What they found was that they were on top of a plateau, at the edge of a cliff, with the Colorado River some 1500 feet below them. There was no apparent way to get the 83 wagons and 1000 head of livestock over that cliff. Or was there . . . ? A narrow crack in the cliff offered some promise. If it could be widened in places, filled in places, perhaps, just perhaps, a wagon could descend to the river. Although it was mid-December by this time, all the able-bodied men put their backs into the task. Meanwhile the main part of the expedition remained camped at Dance Hall Rock some 20 miles away where 40 Mile Spring provided a reliable source of water.

In bitter cold weather, with only the use of hand tools and a little blasting powder, the Saints carved a ramp out of the narrow crevice in only six weeks time. On January 26, 1880 the first wagon was gingerly driven into, and



*Left: Seen from below the "hole" is a mere cleft in a wall of solid rock.*

*Right: a graded and well marked road provides access to this historic part in Mormon history.*



down the narrow slot. The wagon had a steady team at the front, and a dozen men holding it back from the rear. A great cheer went up when it reached the river without mishap. Twenty-five more wagons were driven down that day. In less than a week, the entire expedition had been ferried across the river.

With more hardships in front of them, the colonists arrived at the San Juan River at the present townsite of Bluff, Utah on April 5th. Although the two families at Montezuma were just a few miles upstream, the exhausted group could go no farther. They settled right there. What had been expected to be a month's journey had stretched into five

months and had lasted through the entire winter. But with all the hazards and hardships encountered along the way, not a single life was lost. On the contrary, the colonists arrived with two more human lives than when they started. Two babies were born along the way.

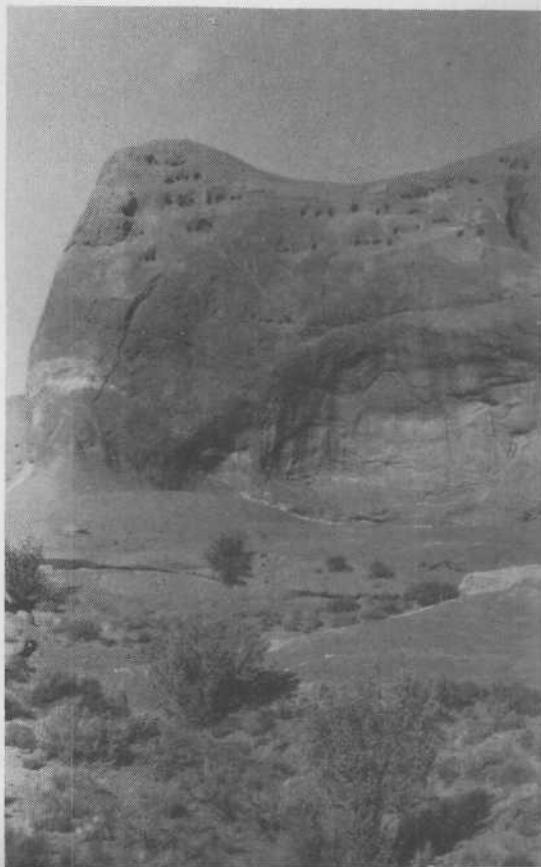
Once established, the Hole in the Rock route did prove to be a short cut. It was used for a full year until Charles Hall lo-

cated a better route 20 miles upstream which became known as Hall's Crossing. During 1880 there was two-way traffic over the Hole in the Rock road with all wagons being driven up the slot as well as down.

The noted historian from the University of Utah, Dr. David Miller, has this to say about the spirit of those pioneers:

"Strange as it may seem, the Hole in the Rock pioneers expressed no doubt about their ability to make the Hole into a passable wagon road. It was the wild rugged country beyond the river that concerned them. Yet the true pioneer spirit prevailed. Through united effort of that valiant band, the deep gulches, solid rock cliffs, and near perpendicular walls of Gray Mesa were overcome. No pioneer group ever demonstrated greater faith and courage, or ever built a road through more difficult terrain. They literally danced, prayed, and hacked their way through almost insurmountable obstacles. They proved that there is hardly any country through which wagons cannot be taken. They had been called by their church to plant a colony and with the help of God they would do it."

If you are interested in reading the story in more detail try to locate an old copy of Professor Miller's book, "Hole in the Rock," published by the University



Above: The slot looking down to Lake Powell. Right: Dance Hall Rock where the Mormons camped for six weeks.

of Utah in 1959. It is well researched and makes fascinating reading.

Hole in the Rock is still there today. A little worse for nearly a century of wear, and the bottom half inundated by Lake Powell, but still there nevertheless. The old wagon road has been graded so that with a little care, the family automobile can make the 65-mile journey from Escalante to Hole in the Rock in a matter of three to four hours. The route is well marked and you should face none of the hardships experienced by the pioneers.

From Escalante, Utah, take State Route 12 east toward Boulder. At a point five miles east of Escalante look for a sign pointing right to a graded dirt road heading south. Before leaving the highway be sure that you have ample gasoline and supplies. It is a lonely 120-mile round trip from here to Hole in the Rock and back.

As you proceed south you will cross a series of washes, some with cottonwoods and seeps of water. Some have colorful and descriptive names like Cat Pasture, Big Hollow and Hurricane Wash. Others have more practical names like Ten Mile Wash and Twenty Mile Wash. At a point 38 miles below the paved highway you will find Dance Hall Rock. It was here, and at nearby 40 Mile Spring, that the Mormon encampment waited six weeks while their men-folk toiled to enlarge the

crack. See if you can still find the names of the emigrants carved into the soft reddish brown sandstone. Walk in to the amphitheater weathered out of the monolith and listen carefully for the faint strains of a lively fiddle still echoing among the sands of time.

From Dance Hall Rock the graded dirt road continues south. Side roads off to the left and right are well marked by Bureau of Land Management signs. Soon another sign announces that you are entering Glen Canyon National Recreation Area. Hole in the Rock is but eight miles beyond. Where the road abruptly ends today, the pioneer trail down the cliff begins. After coming all this way you must certainly climb down a ways to get the feel of what the emigrants went through.

As you look at the slot today, it is obviously much too narrow to permit a wagon and team to go through. Remember that perhaps some 10 to 12 feet of sand and rock was used as fill by the pioneers, and most if not all of that fill has been subsequently washed away. Look

#### About the Author

Roger Mitchell has spent much of his life exploring backroads and forgotten trails. He is the author of *Death Valley Jeep Trails*, *Inyo-Mono Jeep Trails*, *Western Nevada Jeep Trails*, *Eastern Sierra Jeep Trails*, *Exploring Joshua Tree and Grand Canyon Jeep Trails 1*.

up high on the walls of the slot. In places you can still see the marks of picks where the crevice was widened. This was the level of the old wagon road. If you climb to the rim of the crack you can see where wagon loads of sand and rock were poured directly down into the gorge.

Keep in mind, too, that when the Mormons came through here it was some 1500 feet from the top of the crack down to the Colorado River. With the completion of Glen Canyon Dam in 1963, and the resulting creation of Lake Powell, half of the trail going down the cliff is now underwater (when the lake is full).

Whether you come by boat or car, and whether you spend a few hours or a few days at Hole in the Rock, it is an experience you will long remember. □

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# THE PLACER GRAVELS OF RALPH "DRY PAN" FAIR

by RALPH NEELY

In 1966 Ralph "Dry-Pan" Fair returned to the desert to file once more on the placer claim where he was first exposed to and caught "gold fever" in 1934. Except for an occasional short look-in he had not set foot in the area since 1942. Located just off the Black Eagle Mine road about two miles beyond Storm Jade Mines with signs pointing the way, his presence on the claim soon attracted visitors.

Those who met Fair at his diggings found a hospitable, mild-mannered man who was a congenial and interesting conversationalist. He had no tall tales to tell, but his knowledge of this portion of the desert was profound. Everybody was welcome, and many drop-in callers returned again and again. It was my good fortune to meet him soon after he arrived, and I spent many interesting days at his claim during the next two years.

Fair, the man, was always a pleasant and gracious host. But it was Fair, the prospector, whose lengthy bout with gold fever, and his unorthodox approach to the elusive yellow metal caught and held the interest of those who got to know him.

A maverick among the prospecting brotherhood, he not only searched for, but discovered paydirt in a quite unlikely place. Indeed, it was a location most other prospectors wouldn't get caught looking at. To cap it all, Fair dry panned his concentrates, and stoutly insisted this method was just as effective as panning with water! Further, though Fair was able to make his claim pay off in a modest way, no other prospector, he said, bothered to file on it during the many years he left it unattended.

Ralph "Dry-Pan" Fair came to California from Missouri, which might explain his stubborn penchant for independent thinking. The time was 1934, deep into the Depression years, and all he owned was a second-hand car, a flat purse and a determination to look for gold.

Realizing how little he knew, he sought advice from every prospector or mining man he met. It soon became confusing, he recalled, for no two of them were in agreement. His big break came when he met an old-time prospector named Anderson. Something of a maverick himself, Anderson spent considerable time with this eager young man, passing on his lifetime's accumulation of prospecting savvy. Then, Fair declared, was when he first began to know how to go about it.

Among other things, Anderson introduced Fair to dry panning. More importantly, perhaps, the old prospector seems to have stressed that gold is where you find it, but not necessarily where you think it ought to be.

Now Ralph "Dry-Pan" Fair began looking for placer gravels with a new set of rules. His



The run is finished and the riffle board holds all that remains of a large amount of placer gravels. Preparing for the next act Fair empties the riffle board into a black pan. You can see the canvas hopper hanging from the washer, and the small engine to the rear. In the distant background a well weathered old washer ponders.



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*Fair tosses concentrates into the air to winnow out the dust. The interior of the bellows at the bottom of the machine can be seen here. In operation, the screened frame to the lower right of the washer rides atop the bellows and the riffle board rests atop the screen.*

search centered in the mineral-rich western drainage of the Eagle Mountain range. In this area are numerous abandoned gold mines, including such storied names as Mission Sweet, Copper Belt and Nancy. High production costs, lack of water and pinched-out veins (common in this torn and tumbled country) had closed them all. Surface outcroppings of gold-bearing ore are common, though fragmentary.

On the northern edge of this area Fair found paydirt in a short stretch of a tiny wash which meanders through what is little more than a wrinkle in the surrounding terrain. Here he filed his claim.

For over two years Fair performed prodigious labors on his little desert domain. Working his placer gravels enough to produce a modest income was not enough. Finding no color in the stream bed above where a quartz outcropping crossed it, he concluded he had found the source of the placer gold.

All alone he sank two exploratory shafts, one through the quartz in the dry stream bed, the other on the north hillside where the quartz topped out. He found gold, but not in paying quantity. And what there was did not resemble the gold he was extracting from his gravels.

He also checked the entire north hillside with negative results except for an occasional trace of color. It was worth a try, he reflected, but to him the origin of the gold fragments in his dry wash remained a mystery. The south slope was of sedimentary origin and had never shown a trace of color.

Occasionally, Fair related, he would take a day off to explore the nearby hills. Brief trips to the outside for supplies helped break the monotony. He claimed he was too busy to be lonely, but the feeling was there, for he was not a loner by nature. An occasional visit from other prospectors provided the only human contact at the claim. For almost all of the

time Fair was completely alone.

One evening, he told, he saw a light flashing from the lower slopes of Pinto Mountain, miles away across Pinto Basin to the west. He answered with his own flashlight, and for several weeks he and his unknown light beam correspondent exchanged signals each evening. Although Fair made extensive inquiries he was never able to learn the identity of the party at the other end of those light beams.

Even though he was a whipcord lean 200-pounder in those days, his labors finally wore him down both physically and mentally. In 1936, frustrated and ready for a change, he accepted employment with the Alaska Juneau Mining Company. In 1939 he returned stateside to try his luck once more on his desert claim. And in December, 1941, our country went to war.

In early 1942, answering the call, Fair volunteered for a three-year hitch with the Seabees. He saw service in the Pacific and for a brief time was with the occupation forces in Japan. Returning to the states, he married.

Now, with a family coming on, Fair needed a steady income which his placer gravels could not provide, and he took his responsibilities seriously. Not until his son, Ralph Jr., was a senior in high school did he visit the desert for more than a few days at a time. While his son attended high school in 29 Palms, Fair set up housekeeping on his claim.

Fair was never reluctant to demonstrate how he worked his claim. Placer gravels, screened through quarter-inch hardware cloth, were then processed through his dry washer. Powered by a small gasoline motor, the washer shook and blew most of the lighter rock away, leaving "concentrates" on the riffle board. Fair's dry washer included improvements of his own design, but he stressed that proper operation was more important than small differences in construction.

Next, he emptied the riffle board into his soot-black gold pan. Dry panning motions, he explained, were similar to panning with water. Shaking the pan brings the coarser, lighter dry material to the top from where it can be shunted to one side and scraped out by hand. When only a cupful or so remains, the particles that rise to the top are blown gently to the far side of the pan by puff-

ing, using your own lung power. Now, he emphasized, you must recognize the reluctant, dragging fashion in which the heavier black sand (usually hematite or magnetite iron ores in the Eagle Mountain area) and the gold moves across the pan. Learn this well, Fair urged, so you wouldn't be blowing away your gold—if any.

It was Fair's dry panning that drew fire from other dry country prospectors. Wasteful and inefficient, they described it. Not so, Fair replied. With practice you could recover as much gold by dry panning as you would if you panned with water. And a dry pan is ideal prospector's gear. Light and portable, with no moving parts, it needs no batteries, and lets you see your colors.

How efficient could you be with a dry pan? Fair estimated not more than 10-15 percent escaped him. Taking steps to save that small percentage, he believed, would cost more than he would save.

One day, in my presence, a visitor seriously questioned the efficacy of the dry panning technique. To meet the challenge, Fair extracted three tiny grains of gold from his small store and dropped them into a pan of concentrates which had just been dry panned by a friend to whom he was teaching the art. Dry panning those same concentrates again, Fair extracted not three, but six, tiny grains of gold!

Fair firmly believed that there were still plenty of precious minerals around, including gold. Asked for the best way to prepare to search for valuable minerals, Ralph "Dry-Pan" Fair, with no formal training in mining or mineralogy, had a quick answer.

"Take four years at the best mining school in the country. More if you can afford it. And then, if you want to be smart about it, take a job with a reliable mining company. And stick to it!"

Fair had one more vital instruction for prospectors: "Never let the gold fever get too high, for then it becomes a sickness."

When Fair returned to his claim for the last time he had hoped to keep in production on a steady basis. There was also that elusive source of his gold to discover, for he was still convinced it did not derive from the quartz outcropping that ran athwart his dry stream bed. But it was not to work out that way.

Illness as well as age had forced his re-



While Jerry Whitfield feeds gravels to the hopper, Fair carefully checks operation of the washer. The motor is barely visible beneath the pulley. Without a breeze, the dust can get pretty thick.

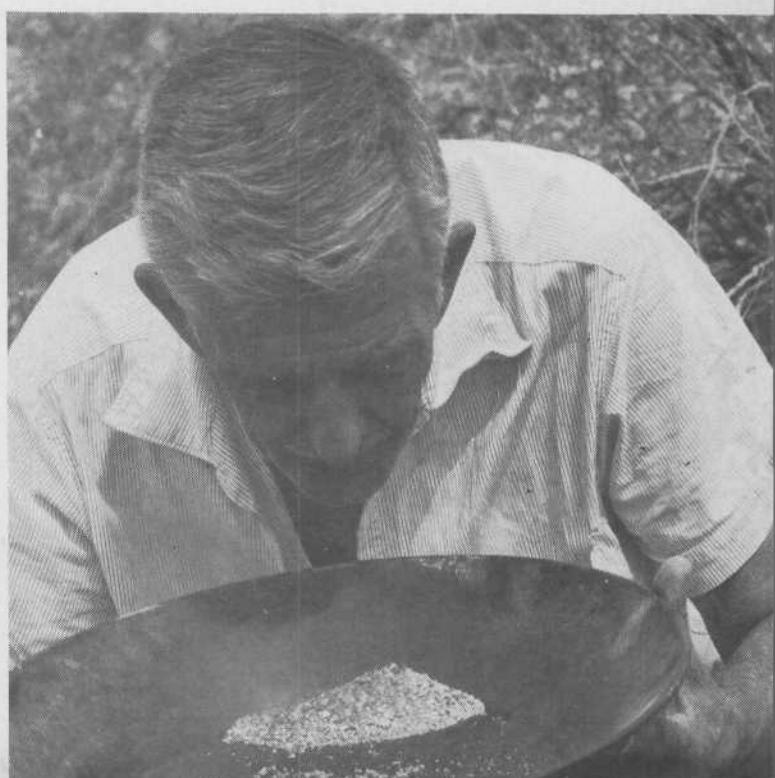
tirement. A few years previously he had contacted trichinosis and before this parasitic disease had run its course it had ravaged his body severely. He suffered almost constant pain, though few of his visitors were aware of it. He was simply unable to keep the pace he had set for himself.

In June, 1968, his body finally quit,

and he died at the home of his son in Rancho Mirage, California.

As a prospector, Ralph "Dry-Pan" Fair raised the hackles on the necks of more than one of the brotherhood of gold seekers by espousing his dry panning. But to all who were privileged to know him, even his critics, he stood high as a man. □

Closeup of Fair nearing the end of a dry panning session. He has just shaken the pan, and is blowing the lighter material to the far side.



# FORGOTTEN TUNNEL TRAIL MONUMENT TO EARLY GENIUS

DESERT CANYON OFFERS UNUSUAL  
LINK WITH CALIFORNIA'S PAST

by BILL JENNINGS

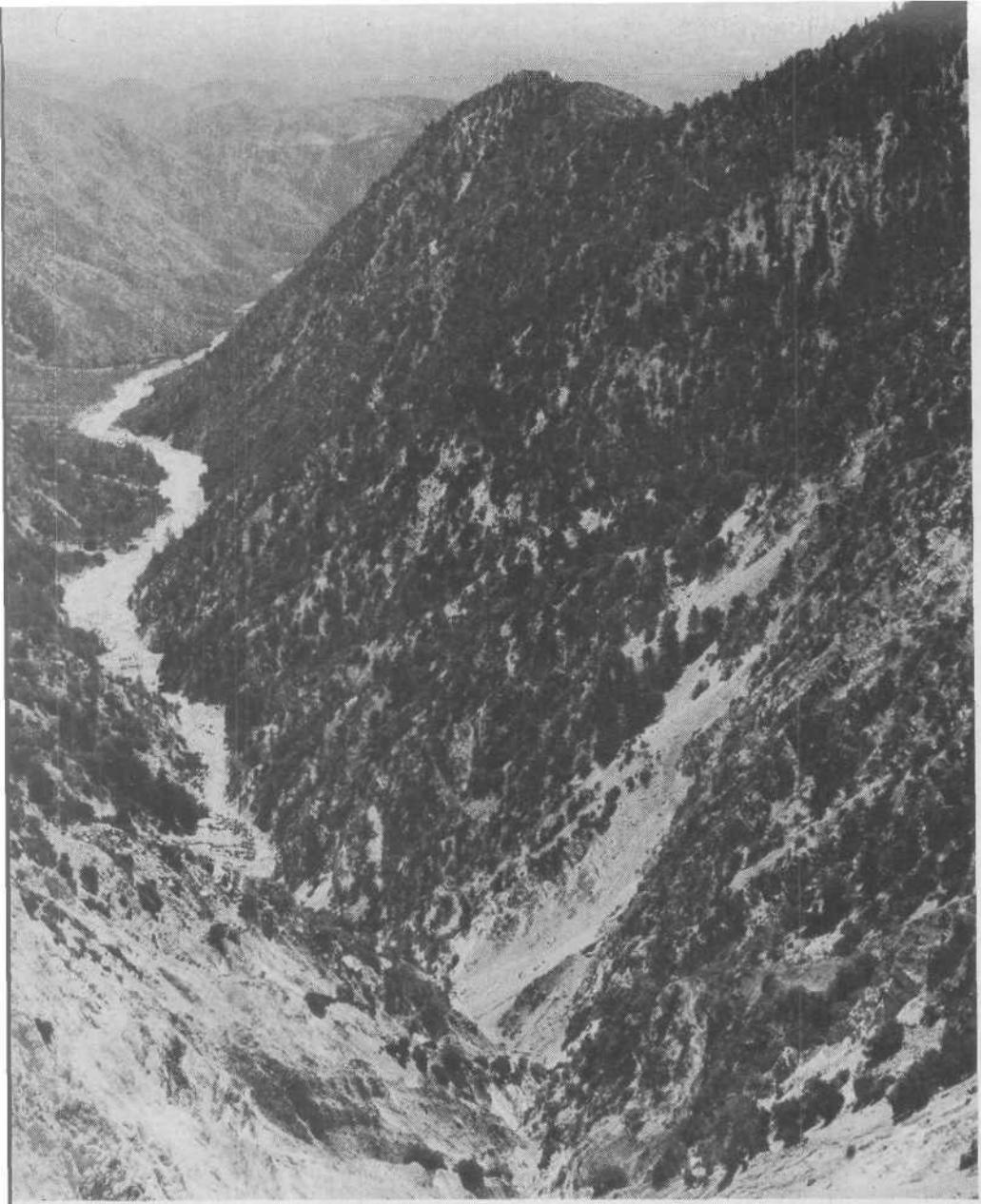


**N** OVERGROWN trail on the desert slopes of California's San Bernardino Mountains northeast of Banning leads to an abandoned tunnel, through piles of handhewn logs and rusted food cans that mark a construction camp, the only visible remains of an audacious water project abandoned nearly a century ago.

The site is still marked, on old maps of the San Bernardino National Forest, as Tunnel Trail and camp, but few current hikers or off-roaders know the site or even where the name came from.

Big Bear Lake's original developer, F. E. Brown, completed the first masonry and mortar dam across upper Bear Creek (a major tributary of the Santa Ana

*Old Whitewater Tunnel Trail, now little used, descends in to the river's south fork over this 6,500-foot pass.*



From Raywood Flat, the seldom-seen Whitewater-Mill Creek jumpoff, looking southeast toward the Coachella Valley and Salton Sea. River's south fork is in foreground, 500 ft. below photographer.

from one watershed—the Whitewater—to another, the Santa Ana, under state law. Ironically, Brown's plan was followed in subsequent years by two of the immense water projects that have led to modern California's agricultural and industrial dominance, the city of Los Angeles' Owens Valley Aqueduct and Metropolitan Water District's even more strategic Colorado River Aqueduct. Both these major works do the same thing Brown tried to, divert water from one drainage to another, but they benefit infinitely more people and have been declared "legal," long since.

Brown was stopped quickly, after erecting his construction camp 15 miles northeast of Banning and making a mere pockmark start at his diversion tunnel.

Technically, the Tunnel Trail and Whitewater camp have nothing to do with Big Bear Lake and the Redlands irrigation system, other than the fact that F. E. Brown was responsible for the whole enterprise. Big Bear failed to produce enough water for both Redlands and the Brown acreage in Moreno (Spanish for Brown) and the Sunnymead-Alessandro areas in what was to become Riverside County on its formation in 1893.

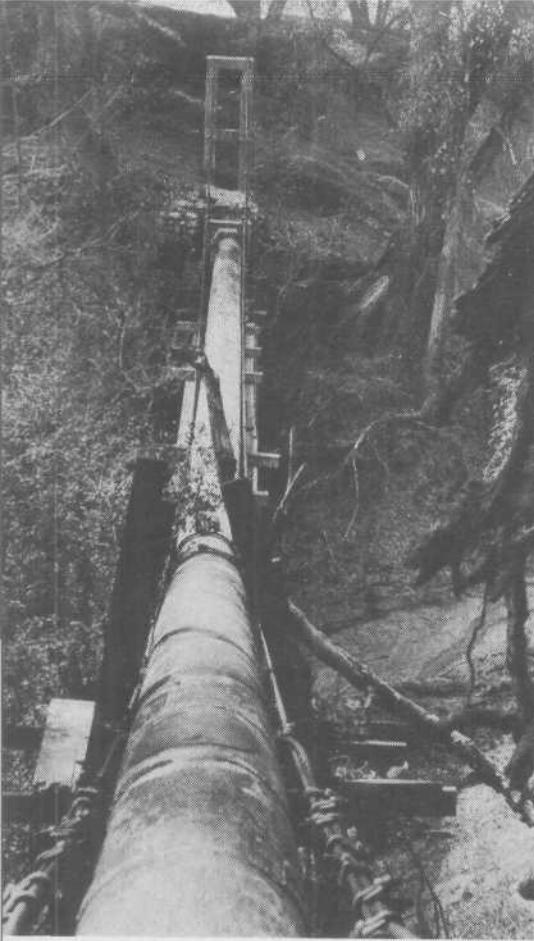
River) between 1883 and 1884 to provide an irrigation system for the Redlands area—and followed up, a year later, with the ill-fated project along the Whitewater River.

The Whitewater, which has more forks in its headwaters than a Washington politician has staff members, rises on the east slope of Mt. San Gorgonio, the highest peak in Southern California, and descends steeply to the Coachella Valley as the main water source for the Salton Sea and the Coachella Valley.

This position, strategically, was the undoing of Brown's grandiose project because it was illegal to divert waters

*The bunkhouse at the old Whitewater water diversion tunnel construction is shown here with hiker Anne Jennings several years ago.*





A suspension bridge carrying a 24-inch steel pipe across Live Oak Creek near the San Bernardino-Riverside counties boundary southeast of Redlands is one of the last visible remains of the ill-fated F. E. Brown irrigation system from Big Bear Lake to the Moreno Valley.

Brown lost control of Big Bear, the Whitewater project and Moreno within a few years, due partially to the financial panic of the time and the superior machinations of his business cohorts. But his legacy remains—in the masonry of the original Big Bear Dam, now submerged behind the newer arch dam under State Highway 18; the tunnels, suspension bridges and aqueduct remnants of the Moreno system and the Whitewater vestiges.

The Whitewater camp and tunnel portals are easily reached by off-road vehicle, with a little brushlands hiking over U.S. Forest Service marked fire roads and trails from Banning via the Morongo Indian Reservation and seldom-visited Millard Canyon.

Truck trails 2S05 and 2S10 reach the area from Interstate 10 via Cabazon and the Indian Reservation, respectively. Distance is about 12 miles from Banning in either routing. Tunnel Trail is officially 2E08, three miles from the head of auto navigation on 2S05 near the seasonally occupied Millard guard station. Another trail, 2E07 leaves the road at the Deer Springs trailhead and reaches the spectacular Whitewater-Mill Creek jumpoff three miles to the northeast, on Raywood Flats, a broad, grassy Ponderosa Pine meadow in the saddle between the Mill Creek and Whitewater drainages.

*Raywood Flat is a saddle between the Mill Creek and Whitewater River drainages in the San Bernardino Mountains. Old wagon road in foreground dates to mining and logging days a century ago. Peak of San Gorgonio Mountain is hidden behind ridge at right.*



A strenuous but reasonable seven-mile loop is available to experienced hikers via the two trails and a short but awesome cross-country trek from Raywood down into the Whitewater—South Fork canyon, one of the most spectacular all-year stream sites in the San Bernardino range.



*Important part of the ill-fated Moreno Valley irrigation project was this tunnel northeast of March Air Force Base. Vandals recently demolished the imposing brick facade, apparently in search of used brick.*



Raywood Flat is also accessible by high-center vehicle from Banning through the long Water Canyon portage along the San Gorgonio River, some 12 miles from Banning. Warning! This route is closed by locked gate and is in the fire season closure, unless you get permission from the city of Banning and the Forest Service.

The closure is due in part to general fire danger and the importance of Raywood Flat and Water Canyon as the principal water source for the city of Banning as well as hydroelectric power for Southern California Edison Company and irrigation water for fruit farmers on the Banning Bench.

Edison's two tiny power plants on the drainage were added to the regional system even before they were completed by the independent San Gorgonio Power Company in 1923. The plants, rated at a combined capacity of only 2,800 kilowatts, seldom operate for more than a few hours a day due to continuing water shortages.

Water Canyon is bear country, too, being the home for a group of elusive California black bears, descendants of Yosemite and King's Canyon renegades transplanted many years ago. Few people have seen them in recent years, although a few years ago a Forest Ser-

vice patrolman reported unofficially he was pinned under pickup by a big bear for several hours.

If you plan to visit the Whitewater historical site, carry a machete for the Tunnel Trail is badly overgrown from its terminus with the Deer Springs trail some three rugged miles from the tunnel portal and campsite.

The campsite is easily identified by the tumbled down roofs and walls of the main bunkhouse and cook shack near the trail, but the tunnel portal, in the southwest wall of the river gorge and a half-mile upstream, may elude you. In 1965, 1969 and 1976, storms washed away the approach trail and tailings from the abortive excavations. And, undergrowth pretty well hides the three-foot diameter opening.

There is no 7½-minute series topographic maps of the area but the 15-minute scale U.S. Geological Survey chart and the Forest Service's San Bernardino Mountains area map serve pretty well.

Both truck trails to the area are passable—with great care—by high-center sedan or pickup. The Tunnel Trail cannot be traversed more than a quarter mile above the Deep Springs trail junction by anything but four-wheel-drive—or couldn't when the writer tried early last summer. □



#### FALL SHOWERS BRING DESERT FLOWERS . . .

Last summer seven inches of rain in the Anza-Borrego Desert caused flash floods and "rewrote" miles of trails and once-familiar washes. More water than we bargained for! But there's good in every raindrop.

A few deep soakings in late summer and fall suggest an exceptional crop of winter wildflowers. A couple of drenching rains in January, added to what we've had, turns the desert into a huge garden of wildflowers.

Nothing in the desert is a fact until it's happened, but if things continue as they started, you'll want to tour the Anza-Borrego Desert State Park this winter just for the flower display. But even without an exceptional burst of flowers, this largest State Park in the United States is a garden of other wonders: Fresh clean air! Blue skies! Warm, dry days and cool nights for sleeping! All through the winter and into late spring.

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# OLD FORTS OF SOUTHERN ARIZONA

*What remains of old Fort Bowie [some 30 buildings] is being preserved by the federal government as a National Historic site.*

*The area is reached only by a one and one-half mile trail.*

by JOE KRAUS



**H**EY WERE footholds of civilization on the western frontier. Their inhabitants often arrived before anyone else. And during their few years of glory, they molded the image of the West. These were the old military posts. And none were perhaps more dangerous or exciting than those forts of Southern Arizona.

It was in Southern Arizona where men such as Kit Carson, Geronimo, Pauline Weaver, Cochise, Hi Jolly, Nachez and General George Crook rubbed shoulders in and out of the military camps. And it was in Southern Arizona, the last stronghold for the Indian in the west, where it all came to an end.

There were such names as Fort Buchanan, Camp Crittenden, Fort Breckinridge and Camp Mason as well as Fort Barrett, Fort Goodwin and Fort Thomas. Most of these are gone now, merging back into the dust from which they came. But a few others such as Fort Lowell, Fort Huachuca, Fort Grant and Fort Bowie are still visible on the Arizona desert.

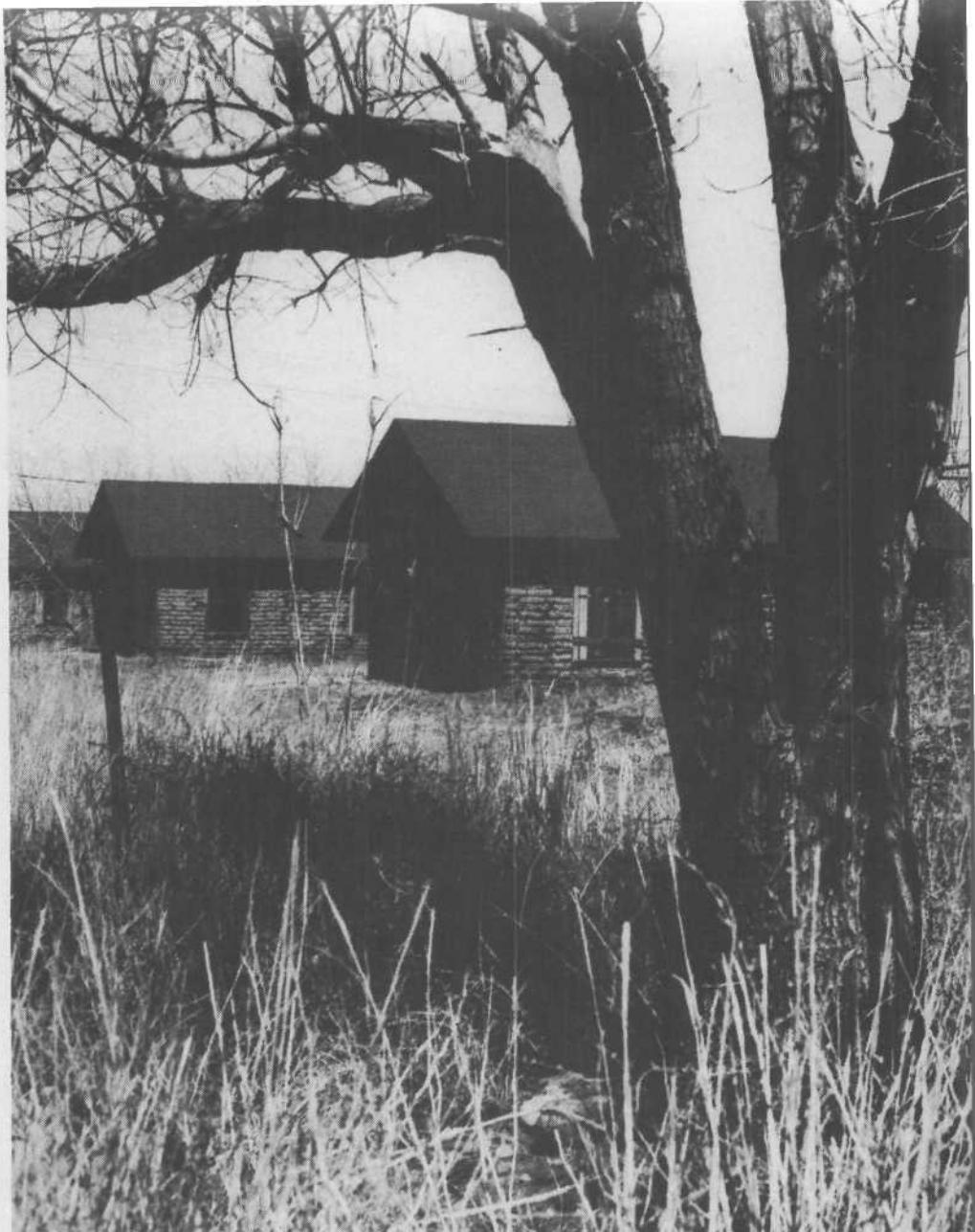
One, Fort Bowie, is a ruin. Another, Fort Lowell, is an historical park. Fort Huachuca is still active, currently operating under orders from the Army. Probably the most unusual use of all is Fort Grant, now a reform school for boys. All of the four forts, however, sport many of the original buildings. And all are living testimonies, half-buried in the desert sands, of those brave men in Army blue who first blazed the westward trail.

#### FORT BOWIE

Many years ago, but after Fort Bowie was abandoned, the one thing that brought home the tragedy of the Indian wars was the Fort Bowie Cemetery. Here, marking settler and soldier graves, were simple wooden markers. A great many of these markers were engraved with the words, "Killed by Indians."

Time, vandals and the elements have (since the fort was abandoned in 1894) taken their toll on the cemetery as well as the old fort. And only a few years ago all was nearly destined to vanish to mingle with the cactus and dust of the Arizona desert. Today, however, thanks to the U.S. Government's maintenance of the area and the fort's designation as a National Historic Site, the fort has been preserved.

Formally established as an historic



*Indian scouts occupied these adobe homes at Fort Huachuca. The scouts gave valuable assistance to the Army during the campaign against Geronimo. Still standing, the homes are no longer in use.*

site July 28, 1972, the site contains 970 acres dedicated to preserving the Butterfield Overland Mail Route, the Apache Pass Stage Station, Apache Springs and the Fort Bowie complex. The park (in its original preserved state) is administered by the National Park Service.

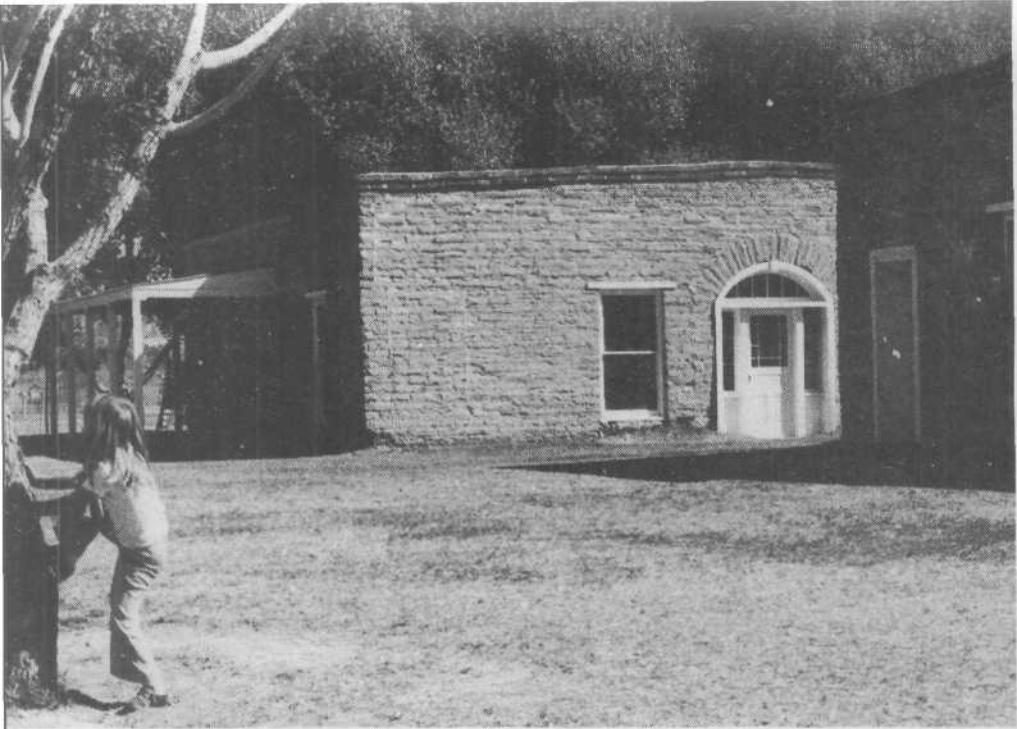
Established in 1862, the fort was base camp for U.S. Cavalry in their fight against the Apaches, first under Cochise and Mangas Coloradas and then Geronimo.

Apache Pass, which Fort Bowie was built to protect, was the site of hundreds of ambushes. Before the fort was built and even after it was a gamble whether a wagon or a coach would make it through the pass—the only way for travelers bound for Tucson. For the early settlers

Apache Pass became a fiery baptismal into the life of Apache country. As a result historians have tagged the area the most dangerous point on the immigrant road to California.

Here was fought the Battle of Apache Pass and here Tom Jeffords and one-armed General Howard rode into Cochise's stronghold to negotiate a lasting peace. The life of Jeffords at Fort Bowie and his relationship with Cochise was the basis of a long-running television series just a few years ago.

Fort Bowie is located near the town of Bowie (east of Wilcox). From Bowie take the Apache Pass road southward for about 12 miles. The well-marked dirt and gravel road will direct you to the Fort Bowie parking lot. From here a one and



The commanding officer's quarters at Fort Lowell has been reconstructed, the culmination of more than thirty years of work by groups and individuals in Arizona. The building contains the room arrangement of the 1880s, and it is furnished as it would have been in 1886 when inhabited by the post commander.

one-half mile foot trail passes a number of historical features to the ruins of the fort. This easy trail takes the visitor past the Butterfield Stage Station ruins, the post cemetery, Apache Spring and the site of the Battle at Apache Pass before you approach the fort ruins. A short side trail leads to the site of the first Fort Bowie. From the parking lot to a casual visit of the fort and then back to the parking lot visitors should allow about two and one-half hours.

At the ruins of the fort visitors will find about 30 buildings, all of which are now only foundations and walls. These include officers quarters, mess hall, the hospital, trading post, school and infantry barracks as well as guardhouse.

#### FORT HUACHUCA

Fort Huachuca (pronounced wah-chu-kah) is 30 miles west of Bisbee on the outskirts of the community of Sierra Vista and within a few miles of historic Tombstone. Established in 1877, the fort's main function was to protect settlers and travelers from the Apache. The Indians, however, carefully watched the maneuvers of the troops and planned their raids accordingly.

In 1882, the camp was made permanent and played an important part in the campaigns against Geronimo. The fort saw little activity after Geronimo's surrender in 1886 until the Madero revolt in Mexico in 1911. Because of its location,

just 15 miles north of the border, it became a base for border patrols during the early years of the Mexican Revolution.

Fort Huachuca has a special significance in the history of the Southwest in that it is the only frontier military post that is still active. Garrisoned by Negro troops during World War II, it trained soldiers in desert warfare. This training was later used to good advantage on the battlefields of North Africa and Italy.

In 1949 the post was transferred to the State of Arizona to be used by the National Guard and the State Fish and Game Commission. It was reactivated in 1951, deactivated in 1953 and again reactivated in 1954 by the Signal Corps. This time it became a vast 76,000-acre electronics proving ground. Today the post employs thousands of military and civilian personnel and millions of dollars have been spent on new buildings and equipment.

Through it all, however, the old fort hasn't forgotten its early history nor has it neglected to preserve some of its old buildings and mementos. Still standing and flanking the old parade ground are the old barracks and administrative buildings dating back to the 1880s. The Carleton House (constructed in 1880) is the oldest building still existing on the post. It has adobe walls nearly two feet thick. It served the post first as a hospital

and later as a school house. In later years, it became a winter residence for two Arizona governors. Also still standing at the fort are several of the original adobe quarters of the Indian scouts.

Near the middle of the post (also in an historic building) is Fort Huachuca's historical museum where old photographs, Indian artifacts, dioramas of various battles, U.S. Army weapons and uniforms are displayed. Another interesting exhibit depicts the fort as the headquarters of the Army's Indian scouts, the last of whom saw active service at the post as recently as 1947. The museum hours are 9 AM to 4 PM daily, 1 to 4 PM on Saturdays and Sundays and is closed on federal holidays. Admission is free.

#### FORT GRANT

Of all modern-day uses of old Arizona forts probably Fort Grant's is the most unusual. The fort, established by the government in 1859 to protect settlers from the Indians, is now a reform school for boys. This happened in 1912, seven years after the old fort was abandoned. The fort, however, hadn't seen any real soldiers since 1898 when they were withdrawn to participate in the Spanish-American War.

Today several of the old buildings are still in use. Most of the original buildings along officers row remain. All of these, however, have been modernized to some extent. Due to the nature of the fort's current use, permission to visit the site should be requested from state reform school officials. The fort is located about two miles from the western base of Mount Graham, some 20 miles southwest of the present town of Safford.

Historically, the fort played a major part in peacekeeping missions throughout the Arizona Territory. But the post is probably remembered more for what became known as the "Camp Grant Massacre" than anything else. The massacre, one of the most horrible episodes in Arizona history and which had many of the characteristics of a modern-day Mai-Li, occurred in 1871.

At that time a band of about 150 Apaches had surrendered to the soldiers at Camp Grant, asking that they be allowed to live peacefully nearby. This was granted with the Army keeping a watchful eye.

Several Tucson residents, however, were enraged over the fact that the Army was harboring Apaches. A mob of



Officers row at Fort Huachuca includes such buildings as this. Modified somewhat over the years [such as enclosed porch], the homes are still in use at the post. The homes line the parade ground and date back into the 1880s.

five Americans, 48 Mexicans and 92 Papago Indians descended on the camp in early morning killing 108 Apaches. With most of the Apache men away hunting, the victims in the massacre were mostly women and children. An additional 29 children were captured, taken to Tucson and kept as slaves. A year later 104 persons were tried for murder in the massacre. All, due to the sentiment against Apaches, were acquitted.

#### FORT LOWELL

The reason for most Arizona forts to be established can be given in one word—Indians. Not so with Fort Lowell. Certainly the fort did protect early settlers from Indians and the fort did serve the territory well between 1862 and 1891. But that's not why the post was first established.

The story goes that during the Civil War Lieutenant Colonel Joseph West's California Volunteers entered Tucson to rid that community of Confederate influence. It was soon evident, however, that there wasn't a great deal of work being accomplished. It was said that the men were just too deeply interested in Tucson's señoritas to give proper attention to their duties. So part of these men were marched out of town, far enough

away in those days to keep many of them out of trouble. There they established a camp—the beginnings of old Fort Lowell. Ironically, however, the fort today is within the city limits of Tucson, just six miles northeast of the downtown section.

Now a museum and public park, ruins of several of the adobe buildings, the guard house, infantry barracks and cavalry barracks remain. The commander's quarters has been reconstructed complete with interior furnishings and is open to visitors from 10 AM to 4 PM weekdays and 2 to 4 PM on Sundays.

The building is closed Mondays and certain holidays. There is no admission charge.

The post in the early days was a supply depot for Southern Arizona and was later a base of operations against hostile Apaches. The later duty was no small job. Indian activity frequently required the fort to turn out almost to the man to keep peace. In one report, the post commander wrote that the Apache raids were so numerous and the pursuit so difficult that sometimes he could do nothing but bite his lips and let the Indians go.

One non-Indian encounter of Lowell troopers was in 1877 when 70 horses were being brought to the fort. Near Gila Bend, some camels—offspring of a pre-Civil War experiment—appeared suddenly, stampeding the horses into a 50-mile run.

The history of Fort Lowell is a mixture of Civil War skirmishes, squelching Indian uprisings, bandit hunting, escorting wagon trains and trying to keep peace with the townspeople of Tucson. Much of the colorful history, nearly forgotten, now lies with the crumbling adobe ruins of Old Fort Lowell. But Tucson residents will probably never forget it all. Like the naming of Speedway Boulevard, the road that leads from the fort into downtown Tucson, for instance. The street derived its name from the cavalry practice of racing mounts between city and fort, thus creating a "speedway" on the once quiet boulevard.

Keeping intact the road's reputation are some modern-day Tucsonans who still believe the "Speedway" is just that. But ask any city patrolman with a handful of tickets to spare and you just may get a different story. Such is progress. □

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Berries of California Juniper are said to be the largest, the fruit 12 to 18 mm. long, compared with the Utah, 6 to 9 mm., or Western, 6 to 8 mm. long. The little points or horns are tips of the ovules.

# JUNIPER-AN ANCIENT B

ONE OF the ancient plant foods of Southwest Indians was the juniper berry. Evidence has been found in prehistoric sites excavated in northern Arizona that the berries were used at least in the period between 600 and 1000 A.D. The juniper also grew in earlier geologic ages, as far back as the Tertiary.

Some of the junipers alive today are believed to be 3000 years old, according to Philip Munz and David Keck in *The California Flora* (1959). They cited *Juniperus occidentalis*, the Western Juniper, that grows up to 11,000 feet elevation. The dating difficulty has been pointed out by Frederick W. Hawkes (Pacific Discovery, California Academy of Sciences, 1976), who referred to the irregular ring pattern and the apparent very slow growth as indicated by the fine grained wood. From samplings, first from a favorable site, he found an average ring count of 38 for each two inches of growth; from one in a dry locale, about 75 rings in a two-inch section; from a

third in an exposed granite ridge area, about 136 rings per two inches of growth. One conclusion was that even a rather small tree may be very old, depending on its environment.

While the "fruits" are called berries, these actually are cones. The genus is a non-conformer in its group, the maturing cone scales becoming somewhat fleshy, and they do not separate, in contrast to others in the nut-bearing Pine or Cypress family. The minute flowers, male and female, are nearly always on separate plants, the male bearing the pollen, the female developing into the coneberry. These ripen in the first or second year, more commonly about September of the second year.

Most botanists place the various species within the genus *Juniperus*, but some use the genus *Sabina* to include the California, Utah and Western junipers.

Another confusion stems from the erroneous common name, Cedar, used especially for *J. scopulorum*, or Rocky Mountain Red Cedar. But several other

junipers in our Southwest also are referred to as cedars. Many ranchers and cattlemen, for instance, used "cedars" in building fences and pioneer homes. Again there is confusion, for some botanists classify junipers in the cypress family. At the same time the few true cedars may be found also in the cypress family under the name *Libocedrus*, rather than *Cedrus*. On the other hand, cypress sometimes may be found in the juniper family. These and other discrepancies that one may encounter in checking manuals, indicate that relationships among the conifers are not fully understood. Even the species are juggled around, with some varietal names; some species may have two or three synonyms.

## Where They Grow

Junipers of one species or another, regardless of the taxonomic problems, are widespread over the West and in most places where Indians live or have lived.

One of the earliest species to be named, *Juniperus communis*, is the one used to give the special flavor to gin and

by  
LUCILE  
WEIGHT

Juniper on mesa near "Cedar" Canyon in Providence-New York mountain area of California. Here it grows with Yucca, and numerous seed-bearing shrubs used by Indians.



# BERRY IN INDIAN CUISINE

is the source of oil of juniper, used in some patent medicines. It is possibly the most widespread, from Alaska to Labrador and south to New Jersey, in Nevada and New Mexico; in Arizona on the Kaibab Plateau, San Francisco Mountains, the Carrizo, Navajo, White and Chuska mountains, usually above 8000 feet.

One of the several varieties of this species is known as the dwarf juniper or groundcedar. Birds and animals eat its dry, resinous, sweet and aromatic berries.

Another, *J. scopulorum*, grows in western Canada, south to Nevada, Arizona and New Mexico, often with the Utah juniper and pinon and ponderosa pines. The berries are smooth and a clear blue, with whitish bloom.

A common species in the Transition zone, *J. monosperma* (considered by some a variety of *J. occidentalis*), was found on the 1891 Death Valley expedition of the U.S. Agricultural Department. It occurs in southern Nevada, in Arizona south of the San Franciscos,

southern Colorado, western Texas and into Mexico. Sometimes called Cherry-stone Juniper, the berries are quite edible.

The Western Juniper, *J. Occidentalis*, spans elevations from 3000 to 10,500 feet, including San Bernardino Mountains north to Washington. It is specimens of this species that sometimes grow so picturesquely through great granite crags. Some have been dated at 3000 years. The berry, bluish black with whitish bloom, has a tough skin with dry scanty flesh, but the seeds are sweetish-pungent and aromatic. They are said to be nutritious, eaten fresh or dried.

One of the most abundant in the Southwest is *J. utahensis*, found in southwest Wyoming, Utah, Nevada (Charleston Mts.), western Colorado, northwest Arizona; and in California east of the Sierra Nevada, in Coso, White and Inyo mountains, below Telescope Peak in the Panamints, over in the Grapevines and in Providence Mountains in Mojave Desert. It grows six to twelve feet high

but often spreads wider than its height. While its berry is smaller than the California species, it is noticeably sweet.

The larger berry of *J. californica* has a dry mealy pulp, somewhat fibrous, but sweet. The bluish young berries become covered with dense bloom, sometimes silvery, the older berries showing a reddish-brown beneath the bloom. They are eaten fresh, or are dried and ground. This species possibly is known by most desert travelers, at the western edge of the Colorado Desert, in Joshua Tree National Monument, the lower San Bernardino Mountains, up to Fort Tejon area, usually below 5000 feet.

**As Indian Food**  
California—Juniper berries at the western edge of the Colorado Desert, ripening from late July to early September, were used for making tea or were chewed to alleviate fever, according to one Indian spokesman. He said they also were dried and stored for winter use.

Other Indians, in the range of the California Juniper, ate the large berries

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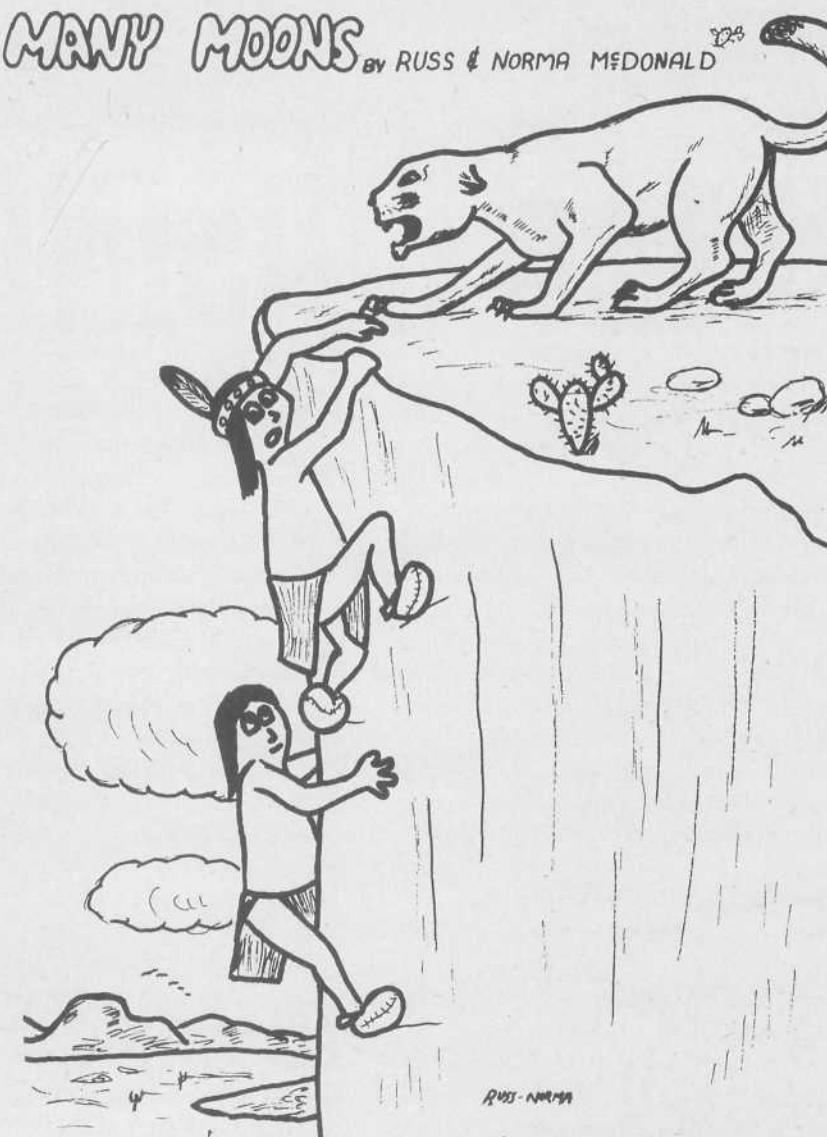
fresh or ground the dried berries. This meal was also made into bread or mush.

Marshal South, in one of his *Desert Refuge* journals, in an early *Desert Magazine* issue, told of the large juniper just outside his Ghost Mountain home and of how the packrats, chipmunks and coyotes gathered and ate the berries. He then stated that the Indians (of eastern San Diego County) ate the berries fresh, or ground them into meal and baked them in little cakes.

Arizona—Juniper ashes were used by the Hopi in connection with corn dishes. One method was to use the moistened ashes for soaking corn, which then was boiled, rinsed, and soaked in salt water. When dried, then parched in hot sand, the result was "pop corn."

A recipe using juniper ash and blue cornmeal is included in "Arizona Cook Book," compiled by Al and Mildred Fischer. Mix 1 cup juniper ash with 1 cup boiling water. Then boil 3½ cups water and strain into it the boiled ashes. Now add 6 cups blue cornmeal, and knead until dough is firm but soft. Break off and shape thumb-sized pieces. Toss into 3 cups water which has been brought to boil. Called "marbles."

Juniper ash also is used in a recipe for an aboriginal paper bread, classified as Navajo or Zora Hesse, in "Southwestern Indian Recipe Book." Burn enough green juniper (not the branch itself) to make 1 cup ashes; mix into 1 cup boiling water, and strain through a colander.



"I CAN'T THINK OF ANYTHING THAT WILL MAKE ME MOVE ANOTHER FOOT, ONCE WE REACH THE TOP."



*California Juniper in full berry, one of the decorative plant growths of Joshua Tree-Pinon area in the huge Joshua Tree National Monument.*

Hughes' "Pueblo Indian Cookbook."

Cube 2 lbs. lean lamb; roll in 1 tb. flour seasoned with salt. Brown in 2 tb. lard or oil, in heavy large kettle. Add corn cut from 6 ears fresh corn, 6 green onions chopped, 2 t. dried wild celery (or  $\frac{1}{2}$  cup chopped celery tops), 5 dried and crushed juniper berries, 2 t. chile powder, 4 cups water. Cover. Simmer 1 hr.

In Rio Grande pueblos, as at San Ildefonso, juniper berries were eaten fresh and also used for seasoning meats. And at Santa Clara the gum from the juniper was used to fill teeth. The gum, at Hano, was used as chewing gum and the shredded bark was used to chink walls and roofs. In early days the bark shreds were bound with yucca fiber and used as torches. The green twigs were toasted on coals then bound over a bruise or sprain to reduce swelling.

We can't imagine the result, but a House and Garden cookbook includes an oyster stew using crushed juniper berries, butter, shallots, onion, garlic, celery, cream and seasonings. In serving, top with whipped cream and small cubes of chilled butter.

The same book again uses juniper berries, powdered, for a super-sounding but complicated Ham en Croute. Among ingredients: beer, bruised peppercorns, whole cloves, burgundy, brandy for flaming, honey, sage, mustard, and for the croute, flour, baking powder, lard, egg and iced milk.

These give an idea of how far from simple Indian preparations one can go with juniper berries.

A little caution for those unaccustomed to the use of juniper. While several writers, including Marshal South, tell of Indians using the dried, ground berries to make cakes, we suspect the pulp was mixed with ground seeds or corn, to dilute the possible effect on the kidneys. As to tea, directions we've found usually are for boiling the green sprigs, without berries, and straining after several minutes' simmering. But again, be judicious in amount taken.

Experiments with some of the wild foods used by the Indians may open a little of their world to us, at least in our imagination. □

Next, bring 3 cups water to boil, then stir in the juniper ashes, then the cornmeal. Cool. Heat lightly greased griddle; carefully spread as thin a layer of batter as possible, by hand. Do not turn. Peel off the cooked batter.

One ethnobotanist stated that juniper berries (Utah species) were eaten by the Hopi, especially with piki bread. The whole juniper was used for medicinal and ritualistic purposes.

An important source for the southeastern Yavapai was the Alligator-bark Juniper (*J. pachyphloea*), possibly the largest in Arizona, which also is found in western New Mexico and on Zuni Mt., and Texas. Berries, ripening in October, were collected after they fell to the ground, then pulverized in bedrock mortars, with pestles. The pulp was soaked in water, put in the mouth by handfuls, the juice sucked, then the pulp spat out. Berries from a smaller species were parched first, to soften them, then eaten as-is.

New Mexico—Up on the Sky City mesa of Acoma juniper berries were brought from below and cooked in stews. Berries also were used there in rattles, so the Hopi said.

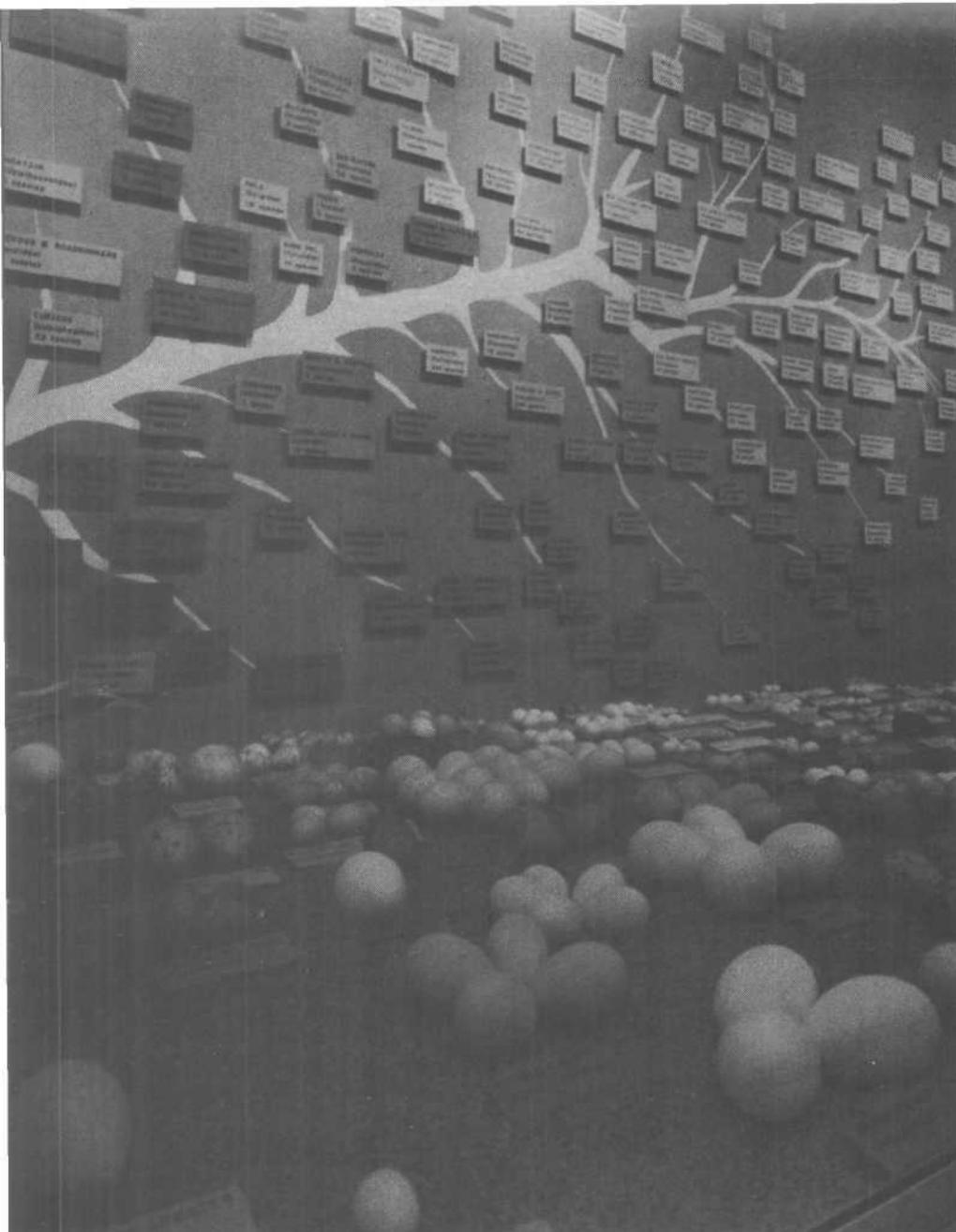
In this state where Indians have used mutton and lamb since Spaniards brought the first sheep in 1540, juniper is added to stew. It's possible that similar concoctions using rabbit included juniper, in Arizona. Below is a typical combination, included in Phyllis

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One of the museum's most unique exhibits depicts the family tree of the birds of the world by means of their eggs.

UCKED AWAY in an orange grove on the sunset side of Redlands, California, and no more than a howdy north of Interstate 10 into and out of the Los Angeles area, is the ultra-modern and recently opened San Bernardino County Museum, repository of what has been described by many experts in ornithological affairs as being the world's largest and most varied collection of birds' eggs and nests.

This remarkable collection was donated to the museum by Wilson C. Hanna, a nonagenarian whose interests in nature in general and in wild birds in particular dates back to the age of five, when his family moved into the Redlands area from the boy's birthplace in Leadville, Colorado, shortly after the lusty boom days of that historic mining town.

A chemist by profession, Hanna's lifelong love affair with birds eventually earned him international recognition among oologists, those professional scientists and dedicated amateurs who devote themselves to that branch of ornithology which deals with the eggs and nesting habits of birds.

Although Wilson Hanna's personal collection activities were carried on mostly within the limits of the continental United States over a period of close to half a century, he was in constant touch with other collectors throughout the world. In this way he was able to enlarge his own collection by trading eggs and nests from his own surplus for specimens from other parts of the world. Eventually his collection numbered the awesome total of some 125,000 individual eggs or, in terms of clutches, approximately 25,000 sets of eggs. They represent most of the bird families from all parts of the earth.

Because eggs are fragile and tend to deteriorate when exposed to light, only representative specimens are offered for public viewing at the museum. Most are kept carefully stored away for preservation as exhibits for future generations of ornithologists and amateur bird lovers.

How much is the Hanna collection worth in dollars and cents? How could

# THE LITTLE BIG WORLD OF OOOLOGY

by C. WILLIAM HARRISON

anyone possibly put a price on it? The cost in time alone of locating the cleverly concealed nests of even the more common varieties of ground-nesting, water-nesting, or tree-living birds would add up to a staggering figure, and the nests of rare species require enormously more time and patience to find. Not only that, but birds are notoriously indifferent to the oologist's passion for studying their nests and eggs. Their breeding season is limited to only a few days of the year, which means that the collector's field activities are also limited to those same few days of the year.

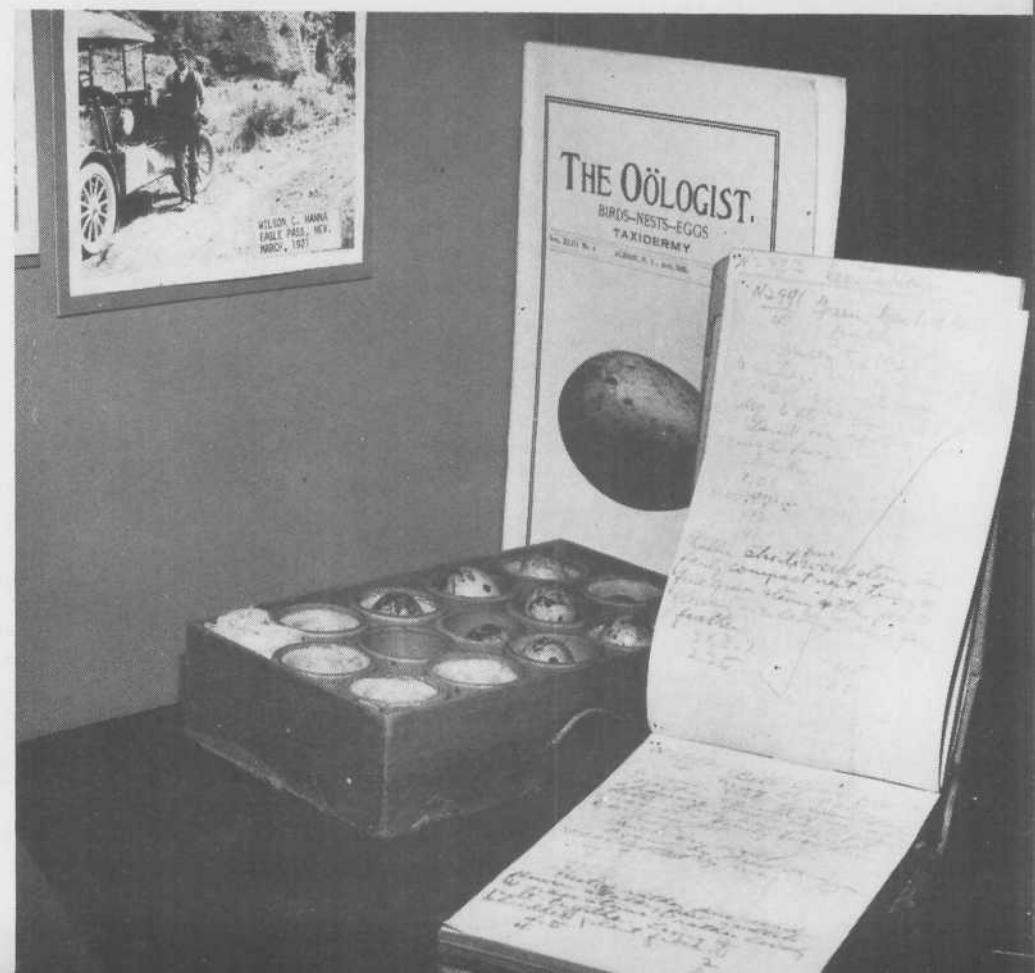
To replace the Wilson Hanna collection at today's costs for travel and field work would without doubt run into the millions. In some instances it could not be replaced at any price whatever. Today's collectors are no longer permitted, as they were 50 or 75 years ago, to travel almost at will from country to country in search of specimens—nor could most of them afford to, at current costs, even if those restrictions did not exist. And, too, innumerable of the world's most heavily populated nesting grounds for birds have in past decades been taken over by housing or industrial developments, or bulldozed into oblivion for agricultural or recreational purposes.

Even more unhappily, many of the species which formerly provided mankind with so much pleasure with their songs and feathered beauty no longer exist. They are gone, forever and eternally erased from the world of nature and man. Among the eggs and nests in the Hanna collection are specimens which bear silent witness against the destruction of their habitats and the havoc of indifferent hunters—extinct or precariously endangered species such as the Passenger Pigeon, Carolina Paroquet, the Whooping Crane, Guadalupe Petrel and California Condor.

To visit the San Bernardino County Museum's colorful and informative exhibits of birds with their variformed nests and their parti-colored eggs (take the California Street off-ramp at the western outskirts of Redlands) can bring a touch of sadness and regret for those species that are no longer with us. But it can also bring a feeling of gladness and gratitude for those thousands of others that still contribute so many lilting songs and flitting images of feathered beauty to the world in which we live. □



*Above: Birds are displayed in lifelike postures with their nests of eggs. Below: Oology is far more than merely a weekender's hobby collecting eggs and nests. It requires the patience and endurance of a skilled hunter, a scientist's talent for observing and interpreting in minute detail and, above all, a respect and reverence not only for the antics and activities of birds, but for all aspects of Nature in this rapidly diminishing world of ours.*



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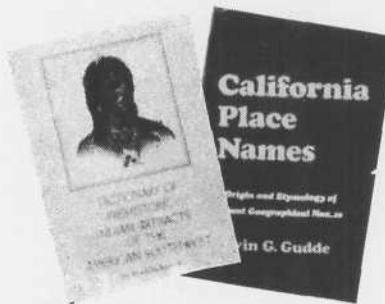
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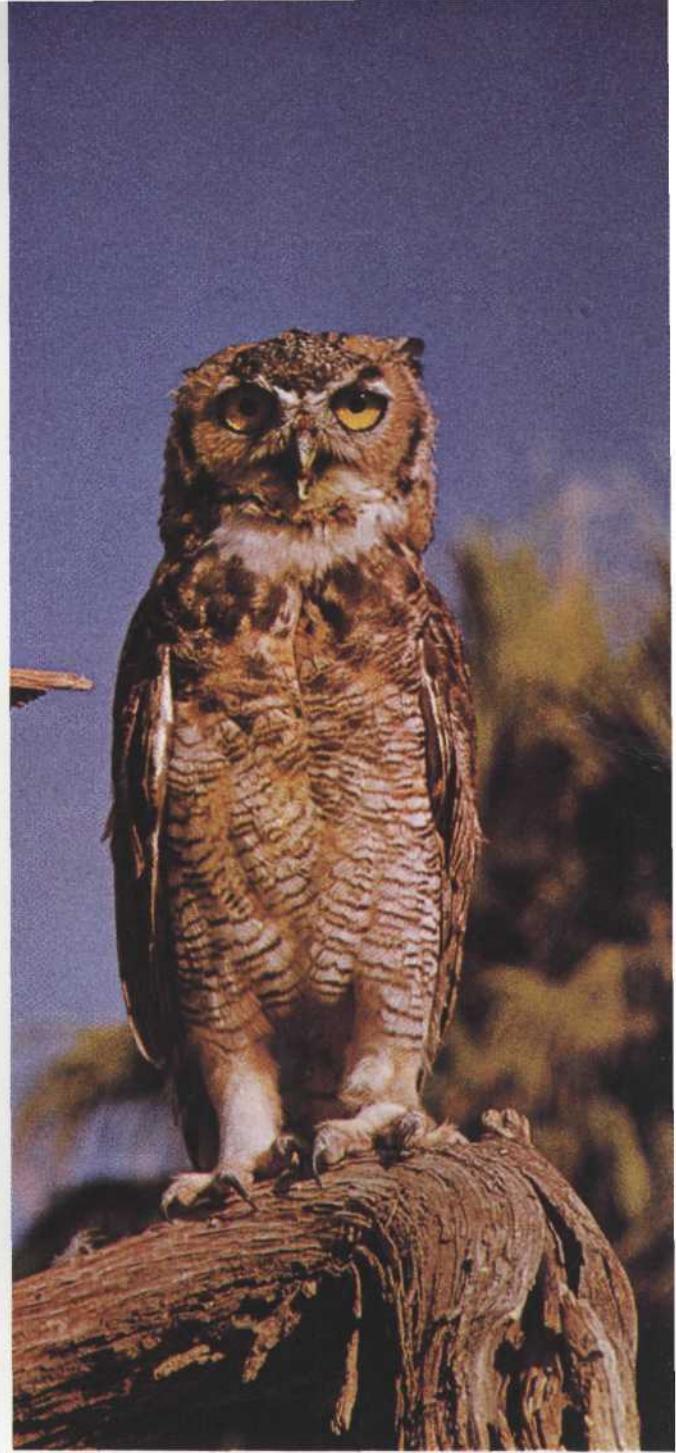


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## THREE SALTY SISTERS

Continued from Page 11

inate the skyline. A few weary buildings mark the townsite and a network of pipes and dikes outline the former evaporative ponds. The old "salt pit" may harbor some crystals and, at the southwest corner of the lakebed, thernardite crystals have been collected.

Mining camp buffs should enjoy visiting this site. While operations have long been idle, the property is not abandoned. Look, take photos but do not disturb any of the old buildings or equipment. The area was not posted when we were there last spring.

### DANBY DRY LAKE

As the crow flies, Danby's lakebed—the last of the "Salty Three"—lies about 30 miles northeast of Dale Dry Lake. Most of the road is paved. A good, graded road leads north from Iron Mountain Pumping Plant and crosses the lakebed. This road is good but stay on it—sand and soft lakebed await the unwary.

On this playa, lenticular bodies of nearly pure rock salt occur near the surface. Some of these bodies are two miles square and 10 feet thick. Crystal Salt



The giant "silos" of the Desert Chemical Company have withstood the desert elements for nearly four decades. Camp and mining operations have not fared so well.

Company was the first to mine the deposits in the 1880s and huge blocks of salt were quarried from the northwest end of the playa. They were loaded on wagons and hauled by steam traction engines to the railroad at Danby—a distance of about 25 miles. The salt was shipped to the silver mines at Calico, as well as some Arizona mines for use in the silver chloridizing process. The Crystal Salt Company built a house from salt blocks which reportedly stood for over 50 years. It was a testimonial to the dryness of the region.

There have been several operations on Danby in recent years, including the Milligan Plant of Standard Salt & Chemical and the Danby Salt Operations. Sometime ago we toured the latter and collected excellent crystals of halite and selenite that had just been exposed by a scraper.

Danby Salt obtained its products by pumping brine from 30-foot wells into large evaporative ponds. A machine harvested the salt and placed it on a conveyor to be washed and semi-dried. It was then put into storage tanks for further drying. A final drying was given in a huge butane drier. The final product was screened into eight sizes and grades, then sacked and shipped by truck.

Fine crystals of selenite and halite can generally be collected from Danby Lake,

as indicated on the map. A shovel, small one-half-inch mesh screen, a bucket of water for cleaning, and paper for wrapping are all the equipment needed. Egg cartons are great for storage of specimens, too. If conditions have been favorable, a day or two of easy digging should produce some nice crystals for your collection and plenty of trading.

During two trips to this locale, every shovelful of dirt contained numerous crystals—both singular and in groups. On a subsequent trip, not a perfect crystal was to be found! This is why I used the word "generally" above. An unusually heavy rain had acted as a solvent on the crystals. Such weather affects mining and, at times, operations are temporarily suspended.

A winter tour of the "Three Salty Sisters" will disclose a different type of mining and offer the rockhound an opportunity to add some interesting crystal specimens to his collection.

The roads are uncrowded and the weather pleasant unless a "front" races through. This is a region of violent contrasts and, at times, it will be "abloom" with a winter spring or lost in the clouds of a desert sandstorm. Perhaps, it is the challenge of not knowing what the desert has in store for us that brings us back to enjoy her treasures again—and again—and again. □

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# Letters to the Editor

Letters requesting answers must include stamped self-addressed envelope

## Painful Memories . . .

The first automobile to cross northern Arizona was probably the one that stopped at Peach Springs, Arizona because of mechanical trouble, in the spring of 1912. I know it was spring because all the snow had melted.

I was a relief telegrapher for the Santa Fe and I sent the message for parts to the Automobile Club of Southern California and requested them sent by Railroad Express to Peach Springs. The auto was a Scout Car sent by the Auto Club to find out if automobile travel was possible across northern Arizona.

The week previous to the arrival of the Scout Car, I was having a severe toothache, but the railroad needed me and would not give me time off to visit the dentist at Kingman.

The most colorful person at Peach Springs at that time was a very tall Section Foreman. This man was the first of our citizens to greet the men in the Scout Car. Soon everybody in town was inspecting the automobile.

A short time later the Section Foreman called to me to follow him back of the Railroad Station. Then he asked me to hold my head back and my mouth open so he could see my painful tooth. He took hold of the tooth and asked if it was the one. I say yes, and he gave the tooth a yank, and he handed the tooth to me. He had borrowed a pair of pliers from the men in the Scout Car. The tooth was pulled so fast I felt no pain, but the memory of losing the tooth is still with me.

ROBERT L. FORD,  
Panorama City, California.

## The Perfect Gift . . .

This displaced Desert Rat has been having a difficult time trying to find a present for my younger daughter's birthday, which is Armistice Day. While reading my October issue of *Desert*, it dawned on me that was it—so I have enclosed my check to enter a subscription of *Desert* in her name. She always traveled the desert with me when she was young and at home. She has seen the best, all 11 western states and Mexico.

Hope my next transfer is back to the West and the desert I love. In the meantime your magazine keeps it all real and alive for me. After all, when you are past the half-century mark you like to keep the old bones warm and make your thanks to the "Great Spirit" each

morning when "Old Sol" rises in the East—not be buried in this forest of trees and poison ivy and rain. Thanks for everything.

DAVID DOTY,  
Hudson, N.H.

## Remembers the San Gabriels . . .

The hydraulic mining story in the San Gabriels (October, '77) was a pip. It brought some fond memories. I passed it on to Bud Nichols, scout master of the troop which has one of my descendants, little Brian, as a member. Bud located a topographic map, vintage 1900, which shows hundreds of trails in the San Gabriels that are lost. Bud and his little scoutlets keep busy on their back-packing trips hunting in the underbrush for these trails, clearing some in hopes of getting the Forestry Department to maintain them.

I was able to recognize some of the trails leading to the East Fork over which I had hiked. I fished every creek, river, puddle and pool in those mountains during my three senior years in High School. (Someone asked my Dad what Guy was going to be when he got out of high school and Dad answered: "An orphan.")

Follows Camp was mentioned in your story, a wide place at the end of the highway into the San Gabriel Canyon. Follows ran stages to the fishing camps upriver and pack-trains to the miners in the East Fork. Two or three days before the fishing season opened, my Indian pal and I would drive to Follows Camp, where we would make ourselves useful loading the pack burros, greasing axles of the stages, grooming saddle horses and cutting firewood. In return, Follows would give us transportation to Camp Rincon, our fishing base.

In those early days there were many miners working the San Gabriel canyons, especially up the East Fork. One lanky Swede had a claim just above the ridge you show which once carried a flume. It was on a plateau about 10 feet above the stream at the lower end and slanted upward about five percent. He would carry the gold-bearing gravel about 50 feet in two large buckets—Chinese style—one bucket on each end of a long pole. Part of the stream was diverted into his sluice box, at the end of which he had staked two goat hides, fleece up. After a few weeks the hides could be burned to recover the flour gold.

GUY GIFFORD,  
Emfa Zeema Acres,  
Joshua Tree, Calif.

## Trilobite Fan . . .

As a subscriber to *Desert Magazine*, I was quite interested in an article on "trilobites" which appeared in the October '77 issue.

I have quite a few that I have collected from several different locations in this province. Not too many unbroken ones, but a few, and I have an acquaintance that has one about five inches long.

HOWARD JOHNSTON,  
Nanaimo, B.C., Canada.

# Calendar of Events

This column is a public service and there is no charge for listing your event or meeting—so take advantage of the space by sending in your announcement. We must receive the information at least three months prior to the event.

JANUARY 28 & 29, 29th annual gem show, "Prospectors Paradise," Santa Ana Armory, 612 E. Warner, National Guard Armory, Santa Ana, Calif. Free admission and parking.

JANUARY 6-8, All State Gem & Mineral Show, sponsored by the Tailgaters Association, California Midwinter Fair Grounds, Casa de Manana Building, Imperial, Calif. Free admission, free parking. Dealers, displays, working lapidary.

FEBRUARY 4 & 5, the Everett Rock and Gem Club's 25th Annual "Silver Commemoration" Rock and Gem Show, Everett Masonic Temple, Everett, Washington. Admission free.

FEBRUARY 10-12, Wickenburg Gem & Mineral Society's Annual Gold Rush Days Show and Sale, Community Center, Wickenburg, Arizona. Free admission. Chairman: Virgil Davis, Star Route Box 11A, Morristown, Arizona 85342.

FEBRUARY 11 & 12, "Fiesta of Gems" show sponsored by the American River Gem and Mineral Society, Inc. Mills Jr. High School, 10439 Coloma Rd., Rancho Cordova, Calif. Free admission.

MARCH 3-5, Maricopa Lapidary Society's 29th Annual Show, "Rockhound's Paradise," North Exhibit Hall, Coliseum, State Fairgrounds, Phoenix, Arizona. Camper parking at Fairgrounds.

MARCH 10-12, Second Annual Deming Rockhound Round Up, sponsored by the Deming Gem and Mineral Society, Deming, New Mexico. Field trips, swapping and tailgating. Ample free parking without hookups. Chairman: Elmer Boehm, 601 Mimbre St., Deming, New Mexico 88030.

MARCH 11 & 12, Annual Spring Parade of Gems, Elks Lodge, 1000 Lily Hill Dr., Needles, California. Dealer space filled. Chairman: Roy Brossard, Needles Gem & Mineral Club, P. O. Box 762, Needles, CA 92363.

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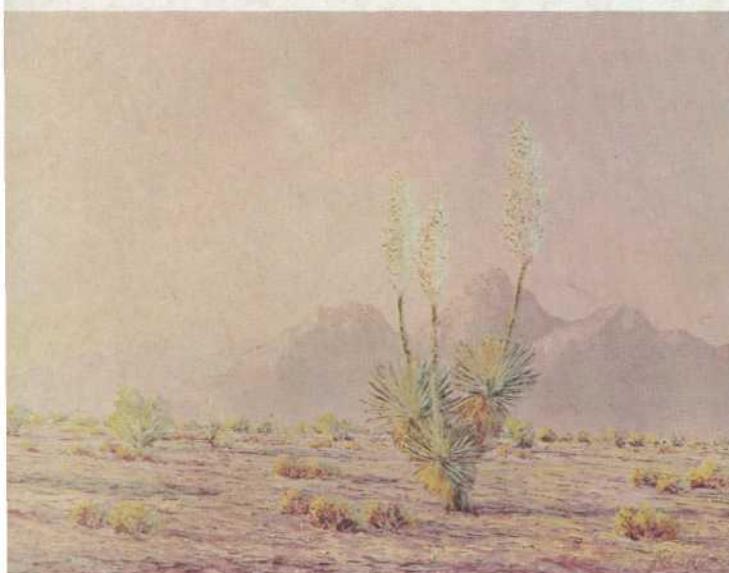
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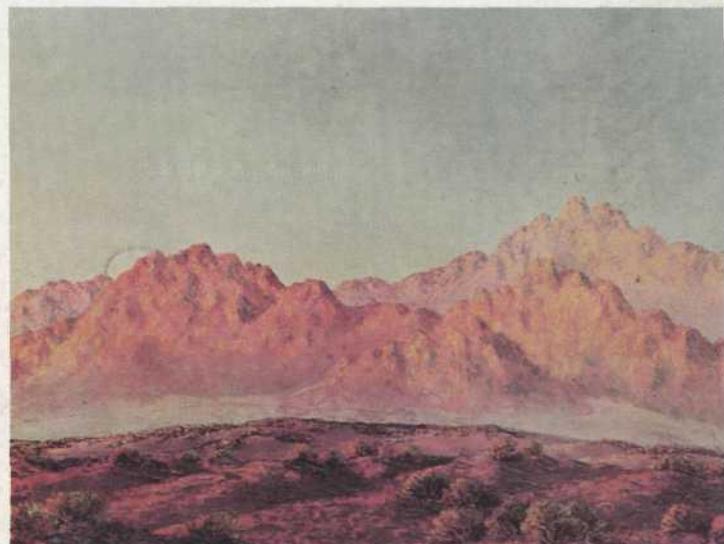


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